VOLUME A

WORK REQUIREMENTS

FIRE SAFETY WORKS

At

Pearse Officers Mess, Pearse Barracks, Defence Forces Training Centre, The Curragh, Co. Kildare

for

THE MINISTER FOR DEFENCE

CONTENTS

Section A **General Information and Conditions**

Appendices

A: Safety documentation required from contractor to be submitted prior to commencement of work on site

B: Typical information required to be handed over to the employer's representative on completion of the project and to be made available to the PSDP to allow compilation of the safety file

Section B **Material and Workmanship General Specifications**

Section C **Detailed Requirements**

Appendices

A: *Drawing Schedule – Not Applicable*

B: *Information to be provided to the ER and PSDP to allow compilation of the Safety File*

Section A

General Information and Conditions

SECTION A – CONTENTS

1. **General Information**
1.1 Location of the Works
1.2 Proposed Works
1.3 Examine the site
1.4 Site Visits
1.5 Working Hour Restrictions
1.6 Water and Electrical Power
1.7 Waste Management and Cleaning
1.8 Protection of the Works
1.9 Asbestos Products
1.10 Access to and Fencing off the Site
1.11 Freedom of Information Legislation
1.12 Temporary Works and Scaffolding
1.13 Making Good
1.14 Existing Services
1.15 Measurements
1.16 Maintenance obligation for Defects Period
1.17 Schedule of Dilapidations
1.18 Setting Out
1.19 Sequencing / Phasing
1.20 Contract Site
1.21 Site Records and Quality Procedure
1.22 Setting out the Works
1.23 Submission of Samples
1.24 Day-works
1.25 Water and Electric Power
1.26 Submissions for acceptance of approval
1.27 Co-Ordination
1.28 Quality Control
1.29 Workmanship
1.30 Documentation
1.31 Environmental Protection
1.32 Materials and prefabricated items
1.33 Site Compound
1.34 Use of Defence Forces' facilities by Contractor's Personnel
1.35 Telecommunications
1.36 Materials, workmanship and equivalent items

2. **Security / Health and Safety**
2.1 Safety, Health and Welfare at Work legislation and regulations
2.2 Responsibility
2.3 Protection
2.4 Safety, Health and Welfare at Work (Construction) Regulations
2.5 Project Supervisor for the Design Process
2.6 Safety and Health Plan – Preliminary
2.7 Project Supervisor for the Construction Stage
2.8 Safety File
2.9 Notification of the Health and Safety Authority
2.10 Safe Pass accreditation
2.11 Security
2.12 Confidentiality of Project Details
2.13 Photographs for Passes
2.14 Private Security Authority Licence
2.15 Specific Safety Requirements

3. **Contractual Requirements**

3.1 Conditions of Contract and Articles of Agreement
3.2 Inconsistencies
3.3 Contract Date, Starting Date and Date for Substantial Completion
3.4 Remedial Work during Defects Period
3.5 Tender documents only for intended recipient
3.6 Lowest or any other Tender
3.7 Insurances
3.8 Insurance of the Existing Building
3.9 Performance Bond
3.10 Currency to be used in pricing the Works
3.11 Publication of Tender Information
3.12 Pay and Conditions of Employment
3.13 Prompt Payment of Accounts
3.14 Materials, workmanship and equivalent items.
3.15 Programme
3.16 Training of Employer's Staff

4. **Building Regulations and Specialist Works Certifications**

4.1 Building Regulation Compliance
4.2 Electrical Subsystems Certification
4.3 Fire Certifications and Markings

5. **Taxation**

5.1 Value Added Tax
5.2 Tax Clearance Certification

6. **Definitions and Explanations**

6.1 ER
6.2 The Works
6.3 Re Use from Store
6.4 Store for Re Use
6.5 Plugging
6.6 Change
6.7 Abbreviations
6.8 Euro norms, Irish Standards, British Standards and British Standard Codes of Practice
6.9 Supply Only
6.10 Fix
6.11 Fix Only
6.12 Timber Sizes

APPENDICES to SECTION A

Appendix A: Safety Documentation required from the Contractor

Appendix B: Information to be issued by the Contractor for compilation of the Safety File.

1. GENERAL INFORMATION

1.0 Introduction

The fire safety works are located at a two-storey early 20th century existing building housing a mix of kitchen, dining, general assembly and a small number of bedrooms on the ground floor with primarily sleeping accommodation to the first floor in Pearse Barracks at the North Eastern end of the Curragh Camp.

The project will include the following works:

1.0.1 Pearse Officers Mess

- New Fire Detection and Alarm System (FDAS) to L1 standard as per IS3218:2024, supplied drawings and detailed specification,
- Install cable tray for new FDAS,
- Provide fire protection to any fire resisting construction penetrations as part of the new FDAS,
- Remove existing FDAS (L4/L2 system) and all associated components,
- Make good surfaces and finishes following removal of existing FDAS,
- Provide confirmation of installation, commissioning and acceptance as per IS3218:2024,
- New PERC Automatic Test System Emergency Lighting (EL) as per IS 3217:2023, supplied drawings and detailed specification,
- Install cable tray for EL,
- Provide fire protection to any fire resisting construction penetrations as part of the new EL,
- Remove existing EL,
- Make good surfaces and finishes following removal of existing EL,
- Provide confirmation of installation, commissioning and acceptance as per IS3217:2023,
- Replaced all ceilings to S1-S6 stairs and first floor raised corridor,
- Establish protected shaft to vertical means of escape at stairs S1-S6, and
- Replace floor covering, paint walls including doors and ceilings in S1-S6 and first floor raised corridor F09A.
- The Contractor shall include all required services provisions as indicated in Defence Forces specifications, drawings and schedules. The Contractor shall cross reference and co-ordinate with Civil/ Structural and Architectural drawings and details to ensure the complete installation is co-ordinated and that all Works Requirements have been considered and included.

The overall project will be carried out by way of one contract. The contract documents, which this document will form part of, relate to this contract.

All requirements of the specification will be costed as per the detail provided. Failure to comply fully with the requirements of the tender document will result in rejection of the tender offer.

1.1 Familiarisation with the Site

The contractor should note that the site is located in Pearse Barracks within the Curragh Camp. The Contractor shall allow for full protection of these buildings and the building occupants during works. Access to these other buildings shall not be maintained.

The Contractor will be deemed to have examined the site to ascertain the conditions under which the installation will occur and the nature of the structure being worked upon. The Contractor will be deemed to have included in the contract sum, all factors affecting the work. Claims for delay or compensation events arising from the lack of knowledge of site conditions will not be approved.

The Contractor shall include all works deemed necessary to make the site safe for both workers on-site as well as working personnel in location.

Site Visits can be arranged by contacting Commandant Shane Phelan (Engineer Officer)

Phone: 045 – 445831/5830/5833

e-mail: shane.phelan@defenceforces.ie

1.2 Scope of Works

See above 1.0 Introduction.

1.3 Programme of Works

The Contractor shall submit to the Engineer his planned timeline and a full method statement for the execution of the required work together with cash flow projection.

1.4 The Site

Where disruption is unavoidable, the Contractor shall inform the Engineer Officer not later than four working days prior to the commencement of that work and provide a detailed statement of extent and the program for the works. All services to the building excluding those specifically listed in the tender documents are to be maintained during the Works.

Any damaged caused to the buildings by, or as result of the Contractor's work shall be repaired immediately at the Contractor's expense.

The site shall be kept clean and tidy for the duration of the works. No activity shall be conducted in such a manner as to cause any contamination of the site or to cause hindrance to free access to any part of the works or the area.

The work to be done consists of electrical engineering and builders work to make Fire Safety upgrade to Pearse Officers Mess, DFTC, Co. Kildare to ensure the existing building services are maintained.

1.5 Working Hours Restrictions

Except with prior approval, the Contractor will only be allowed to carry out work on site between the hours of:

Mon to Fri 0800 Hrs to 1700 Hrs

Work will not be permitted on Public/Military Holidays nor on Sundays

1.6 Water and Electrical Power

There is no water mains supply to the site. Electric power is not available on site.

1.7 Waste Management and Cleaning

The Contractor shall dispose all rubble and waste arising from the works off-site as it arises. The Contractor shall maintain at all times on site a waste skip, or skips, appropriate to the work being undertaken from time to time. Skips shall be properly protected against wind dispersal of materials therein and clearly marked to avoid creation of a hazard by either day or night, removed and replaced whenever filled.

The Contractor shall be deemed to have included in their tender for thoroughly cleaning the site of the Works and any other areas affected by it on completion of the work. All rubble, plant and materials shall be removed and any areas damaged shall be reinstated at the Contractor's expense. Where relevant to the specific project, all mortar and paint splashes shall be carefully removed and backgrounds left perfect, glass and mirrors cleaned and polished, carpets thoroughly vacuum cleaned and vinyl and linoleum coverings washed, cleaned, polished and sealed in accordance with the manufacturer's instructions.

In the event of the Contractor failing to comply with the above requirements, the Employer shall retain a specialist company to carry out this work in accordance with the procedures set out in the Conditions of Contract. The cost shall be charged to the Contractor and shall be deducted in the calculation of the amount owed to the Contractor.

All waste disposal is to comply with the relevant regulations and statutory acts. This will consist of using an agent holding a current Waste Permit Licence from the Local Authority in whose functional area the disposal of the waste is to take place.

1.8 Protection of the Works

The Contractor shall be deemed to have included in his tender for the protection of all the completed works, existing structure, adjoining structure, windows etc. and the provision of temporary coverings and weatherproofing wherever the building is opened to the weather.

The Contractor shall be responsible for any damages caused to the structure and fabric of the building during the course of the works and these shall be repaired immediately at the Contractor’s expense.

1.9 Asbestos Products

Where asbestos is known to be present in an area on which work is to be carried out as part of this project, the procedures for dealing with it are set out in the tender documentation.

Where the tender documents do not provide for the presence of asbestos and the Contractor encounters any material suspected of containing it. Where asbestos is found or suspected to be present in areas not identified in the tender documents. Work shall be immediately suspended in its vicinity and no other work shall be carried out which might expose either the Contractor's personnel or third parties to contact with the suspect material or of releasing it into the environment. The ER shall be informed immediately and his instructions awaited. If any of the material has been disturbed, the area shall be sealed off and the advice of the Health and Safety Authority sought immediately on the treatment required for personnel who may have been in contact with it.

After the immediate isolation of the area found to be contaminated, the directions of the ER shall be sought about the procedures to be followed and how the works are to be progressed so that delay and disruption is minimised

Work on asbestos containing materials shall be carried out in accordance with the appropriate legislation and regulations.

1.10 Access to and Fencing off the Site

The Contractor shall provide a secure and clearly marked hoarding to ensure that the extent of the site area being worked is clearly defined. The Contractor shall mark it with warning signs to make clear that access to third parties is not allowed. Hoardings and gates shall be a minimum of 1.8m high and may be either Heras type fencing, securely located, or boarded and framed panelling.

The Contractor shall confine his operations and site occupation to the area within the hoarding except when necessary to carry out work forming part of the Works Requirements.

Where it is necessary to open trenches or carry out other work outside the hoarding line the work and its associated dangers shall be clearly identified. If it necessary to leave excavations or incomplete ground works in place outside working hours that may present a threat to third parties the Works shall be fenced off, marked with warning signs and provided with warning lights.

The areas to be hoarded off are shown on the Site Plan. The Contractor shall allow for removal of the hoardings on completion of the work on site and make good. The Contractor shall use enclosed areas as the project, material storage and administration area. The Contractor will make good the site on completion of the works by reinstating all damage caused, including that caused to areas outside the site area.

The Contractor is required to make arrangements for parking by his personnel, sub-contractors or any other visitors to the site within the site area.

1.11 Freedom of Information Legislation

The Department undertakes to use its best endeavours to hold confidential any information provided by the tenderer subject to the Department's obligations under law, including the Freedom of Information of Act, 1997 and its amendments. Should the tenderer wish that any of the information supplied by him with the tender submission should not be disclosed because of its sensitivity he should, when providing the information, identify same and specify the reasons for its sensitivity. The Department will consult with the tenderer about this sensitive information before making a decision on any Freedom of Information request received.

If the tenderer considers that none of the information supplied is sensitive, he shall make a statement to that effect. Such information may be released in response to a Freedom of Information request.

1.12 Temporary Works and Scaffolding

The Contractor must provide and maintain all necessary temporary supports, shores, etc. required for upholding the existing work during the course of the Works. The Contractor shall alter and adapt the temporary Works as necessary and shall clear them away and make good any work disturbed on completion. The Contractor will be solely responsible for the adequacy of the design of temporary supports.

The Contractor shall supply and erect all necessary scaffolding as deemed necessary.

Provide, erect and remove on completion all scaffolding, working platforms, safety netting, overhead pedestrian canopies, etc., in accordance with IS EN 12810 and 12811 and, HSA Code of Practice.

Before alterations are commenced to the structure, the Contractor shall submit details of proposed temporary supports to the ER, particularly where opes are to be formed or where alteration works carried out to structural elements.

1.13 Making Good

The Contractor shall be deemed to have allowed for the cost of all making good in the Contract Sum. All making good is to match the adjoining work in both materials and workmanship, to be of a proper standard of workmanship such as to leave the resultant areas to the satisfaction of the ER. Any unsatisfactory making good is to be rectified at the Contractor's expense.

1.14 Existing Services

The site contains underground services. Their location together with the ground condition should be noted before moving heavy plant or machinery and when planning excavation works. The Works shall be deemed to have been priced on the understanding of such services being encountered and the Contract Sum shall be deemed to have included for the cost of hand excavations in their vicinity and for the measures required to protect them.

The ER shall be contacted to ascertain the presence and nature of existing on-site services prior to any work being commenced on site.

Where described in the Contract, new services (gas, water, electrical, drains) shall be connected into the existing services. Before entering or breaking into an existing services, the Contractor shall give notice of his intention to do so to the ER.

1.15 Measurements

No alteration of required measurements will be allowed. All work shall comply with BS 5964.

Any alteration to any measurement required shall be provided by the ER to the Contractor. Should the Contractor be of the opinion that such an alteration is required he shall seek the confirmation of the ER before adopting a change.

1.16 Maintenance obligation for Defects Period

The Works Requirements include an obligation to maintain the mechanical and electrical installations, in addition to remedying defects, until the expiry of the Defects Period.

1.17 Schedule of Dilapidations

The Contractor, on taking possession of the site, shall submit to the ER a photographic record and a detailed schedule of dilapidation's internally and externally (as appropriate) of areas that will be affected by the execution of the Works Requirements. The agreed schedule will be held as a record on the condition of the existing building when possession was granted. The provision of this record does not mitigate the Contractor's insurance responsibilities under the Conditions of Contract. The Contractor shall also undertake and submit to the Employers Representative a photographic record and detailed schedule of adjacent buildings and roads.

1.18 Setting Out

At the beginning of the Contract, the Contractor shall establish an approved primary bench mark and base line on which all subsequent setting out work shall be based. Setting out shall comply with BS 5964.

1.19 Sequencing / Phasing

The Contract Sum is deemed to include for any and all costs associated with providing adequate access to the Works and for maintaining same for the duration of the Works.

The Contractor shall refer to the restrictions and limitations imposed elsewhere in the Works Requirements on hoarding lines and the Contract Sum is deemed to include for any and all costs associated with same.

It will remain the Contractor's responsibility to give reasonable notice of forthcoming operations that may affect third parties in order that the ER is aware of any requirements the Contractor may have and the Employer can be advised accordingly.

1.20 Contract Site

The area to be occupied by the Contractor and placed under their exclusive control for the purposes of the contract for any period during the contract are as described and identified elsewhere in the Works Requirements.

The Contractor shall, subject to such reservations as set out in the Works Requirements, have exclusive possession of the designated area for the relevant period and shall protect and secure it in accordance with the Conditions of Contract.

Fit all compressors, percussion tools and vehicles with effective silencers of a type recommended by manufacturers of the compressors, tools or vehicles.

The Contractor shall keep the Works moist where practical to limit the concentration of airborne dust particles during dust generating operations and in particular during cleaning operations.

The Contractor shall ensure that no damage is caused to the existing roads and paths due to the delivery of materials, the execution of works, or the removal of rubbish. All vehicles entering or leaving the site carrying loads which constitute a potential hazard shall be inspected to ensure the loads are properly protected and those requiring attention shall not be permitted to leave the site.

The Contractor shall be responsible for keeping all highways and campus roadways adjacent to the job site free from dirt, dust or other materials which are due to his own and all other operations and safeguard the Employer from any liability resulting therefrom.

In the event of fouling or damage of any roads due to any operations the Contractor shall clean them expeditiously to the satisfaction of the ER. The Contractor shall be entirely responsible for any damage due to his failure to comply with this requirement.

The Contractor is deemed to have made due allowance in the Contract Sum for re-arranging any hoarding, etc., to facilitate his access arrangements and the safety of the public and for the completions of elements of the Works.

The Contractor shall confine his activities to the site included in the Contract and shall not allow his personnel to trespass on other areas of the Campus except for execution of Works included in this Contract.

1.21 Site Records & Quality Procedure

Provide for maintaining a full set of site records of all labour, materials and plant used on the Works to the approval of the ER. These should be issued to the ER every two weeks as part of the Contractors report.

If no quality system is in operation, the Contractor / Sub-contractor must comply with the following minimum requirements:-

a. Identify the personnel responsible for the project management, site management, safety, and for inspection and testing of the works and for the verification of such tests.

b. Ensure that an adequate document control procedure is in place for the project, which will ensure that a drawing register is maintained to record details of all drawings received relating to the project, including revision status, and their circulation recorded.

c. Have clear purchasing procedures, which will document individual orders for all materials to be incorporated in the project. Such documentation or purchase order should incorporate the project number and date of order, the supplier's name, address, description of materials including requirements to confirm to European standards.

d. All deliveries to site must be checked by a designated person and materials not meeting specifications to be identified, segregated where practical and details of non-confirming product and the remedial action to be taken and recorded.

e. Provide evidence to the ER if required of specialised training of site personnel.

f. Provide schedule of inspection and test to the ER, which will list the relevant tests, the persons responsible for carrying out the tests and the personnel responsible for verifying that the tests have been carried out.

The Contractor shall provide and maintain on site for the project team, a digital camera and associated facilities for the provision of photographic records. The Contractor is to provide fortnightly photographic records of the progress of the Works. The Contractor must issue A4 format prints for the ER's information accompanied by a key plan and the location reference, photograph number, date taken and issue date for the photograph.

1.22 Setting out the Works

Prior to commencement on-site the Contractor shall establish and sign off with the ER an agreed datum. The ER shall determine, in relation to that datum, any levels, which may be required for the execution of the Works.

The Contractor shall be responsible for checking all site dimensions against the dimensions indicated on the issued Architect's / Engineer's drawings and satisfying himself as to their correctness.

1.23 Submission of Samples

When requested by the ER, samples of all materials proposed to be used for the works shall be submitted to him, together with the name and address of the supplier and such information, instructions and directions as the supplier has issued. Samples shall be submitted for approval to the ER prior to the delivery of the materials to site.

Adequate time shall be allowed in the programme for the sign-off of all samples by the ER

The Contractor is to note the list of required samples, as set out in the specifications of the relevant design team members' specifications e.g. Architect's specification for Architect's required samples.

The Contractor shall include for supplying and storing systematically the samples requested in a Sample Room. Approved samples shall be retained for comparison with products used in the Works.

All materials and prefabricated items shall be manufactured and tested in accordance with the specified requirements. When evidence of conformance depends solely on inspections and tests performed by a sub- contractor, manufacturer, supplier or independent inspection authority no materials or prefabricated items shall be used in the works until it has been verified that they comply with the specified requirements.

Where appropriate, all materials and prefabricated items delivered to the site shall bear the manufacturer's name, brand name, or any other data that may be required to verify the exact nature of the material or item and relate it to the specified Works Requirements.

Where applicable, materials and prefabricated items shall be obtained from suppliers and manufacturers who have been assessed by an independent certification authority accredited by the National Accreditation Council for Certification Bodies.

Where applicable, materials and prefabricated items shall bear the EN certification mark or other appropriate certification mark.

Transportation, handling and storage of materials and prefabricated items shall be controlled to prevent misuse, damage or deterioration.

1.24 Day Works

Day-works shall be executed only with the written permission of the ER. Where this authority is given, original vouchers giving the fullest particulars of hours worked, names of craftsmen and general operatives, together with rates of wages paid, description of work executed, materials, plant used up to Friday and delivered to the ER before the following Friday.

All sheets are to be signed by the foreman and the ER. Such signatures are only to be taken as certifying that the time, materials and plant are correct and shall not be held to justify a claim that the work shall be so charge or that it cannot be measured and priced according to the terms of the contract.

Labour shall be priced at the appropriate SEO rates, hired plant shall be charged in accordance with the Schedule of Plant Charges or local hire rates and materials as per bona-fide invoices (subject to confirmation of competitive procurement). All percentage adjustments provided for by the Conditions of Contract shall be made using the information tendered by the Contractor in Schedule Part 2 to the Conditions of Contract.

1.25 Water and Electric Power

No guarantee shall be given about the amount of power and water available to the contractor or any sub-contractor.

1.26 Submissions for Acceptance of Approval

Where submissions for approval are specified, the Contractor shall prepare and submit with his Master Programme a schedule of such submissions, co-ordinated with the Programme and including agreed time allowance for submissions and approval before the related work commences.

Shop drawings, calculations to support details and components chosen and any other relevant information shall be submitted not less than 2 weeks or 10 working days before manufacture begins.

The Contractor shall check that all shop and installation drawings are complete and co-ordinated. The Contractor shall confirm in writing that he has done so.

1.27 Co-ordination

The Contractor shall check all drawings and schedules to ensure in time that he has sufficient information to carry out the work. If the Contractor considers additional details are required, he shall notify the ER immediately.

The Contractor shall obtain approval for the size and position of any hole, chase, insert or fixing required before the related work begins.

1.28 Quality Control

All Works undertaken are to comply with the following:

- The Works Requirements
- Building Regulations and subsequent revisions and associated Technical Guidance Documents.
- Building Control Regulations

1.29 Workmanship

Shall comply with BS 8000: 2011 – Works on Building Sites.

The Contractor shall keep on the works a competent foreman or site agent and any instructions given to him shall be deemed to be given to the Contractor.

1.30 Documentation

The Contractor shall maintain records to substantiate conformance to specified requirements, including work carried out by subcontractors, manufacturers, and suppliers. As required under the Building Regulations Amendment 2013, the Contractor is to provide a Certificate of Compliance by a Chartered and Bonded Engineer.

1.31 Environmental Protection

All construction and demolition waste removed off site shall go to a licensed/permitted waste recovery facility and be carried out by a contracting firm permitted under the Waste Management Collection Permit Regulations 2001 and Waste Management Act 1996.

The Contractor is to take all reasonable precautions to minimise nuisance to the occupants / users of adjoining Defence Forces' properties and to the general public and to include for complying with all statutory regulations in this regard.

Burning of waste/debris will not be allowed on-site as this is an offence under the 1987 Air Pollution Act. Mud or debris will not be allowed onto the public road from works involved from the site.

Dust deposition shall not exceed 340 mg/m^3/day beyond the boundary of the site.

Roads in the vicinity of the site shall be sprayed with water in times of dry weather to control dust resulting from operation on the site.

Top soil shall be stored on site for landscaping purposes as far as possible. Surplus topsoil and subsoil must go to a licensed facility as specified in the Waste Management Act 1996 or to a recovery

site with a waste Permit issued by the County Council. The haulier of the topsoil must be permitted under the Waste Management (Collection Permit) Regulations 2001.

No foul water, waste effluent, contaminated water e.g. painters fluids, concrete slurry, plasterers fluids, toxins, etc. shall enter the foul or storm water drainage system or discharge to land drains, soakaways etc.

1.32 Materials and Prefabricated Items

No materials or prefabricated items shall be used in the works until it has been verified that they comply with the specified requirements.

Where applicable, materials and prefabricated items shall be obtained from suppliers and manufacturers who have been assessed by an independent certification authority.

Where applicable, materials and prefabricated items shall bear the British Standards Institution certification mark, the Irish Agreement certification mark or other appropriate certification mark.

Transportation, handling and storage of materials and prefabricated items shall be controlled to prevent misuse, damage or deterioration.

1.33 Site Compound

Provide and maintain toilet facilities, washing facilities, drying room and canteen(s) for the Contractor's staff and watertight shed for the storage of materials, tools and tackle in positions to be agreed with the ER.

Thoroughly clean area used for the compound, make good and leave in unimpaired condition on Substantial Completion of the Works.

All materials shall be securely stored or tied down. Waste materials, rubble and debris shall be removed from the site as it arises. All possible steps shall be taken by the contractor to ensure that nothing off the site may be blown off the site area. Under no circumstances shall materials be burned on site.

1.34 Use of Defence Forces facilities by Contractor's Personnel

The Contractor's personnel shall not use the canteen or toilet facilities provided for personnel of the Defence Forces.

1.35 Telecommunications

Connections to the networks of commercial telecommunication providers will not be available for the Contractor's site compound. Connections to the Defence Forces private network will not be provided. The Contractor will be deemed to have included in the Contract Sum for all measures required, and charges arising, to facilitate telecommunication and data services to and from the site.

1.36 Materials, workmanship and equivalent items

All materials used in the work shall be new and unused unless specifically required to be salvaged or re-used by the Contract documents.

Materials and workmanship shall be of the best quality and shall comply with all relevant European Community Standards or, in the absence of such a standard for a product or material, relevant Irish Standards and Codes of Practice.

Materials shall comply with the requirements of the European Communities (Construction Products) Regulations, 1992.

Only fully qualified and competent tradesmen and helpers shall be employed on the Works. Work shall not be sub-let or done by sub-contractors without the Employer's Representative's permission.

All work shall be carried out within the tolerances specified in BS 5606. No work shall be covered up prior to inspection and approval by the Employer's Representative.

Wherever a proprietary name is used to specify a material or process it shall be deemed to have the term 'or equivalent' appended to it.

Where a material or process is described by reference to its proprietary name, the name is used to indicate the standard of construction, appearance, ease of maintenance and durability acceptable to the Employer's Representative. The Employer's Representative will approve the use of alternatives where such alternatives are shown to equal or surpass the qualities of the product or process specified. Accordingly proprietary names wherever mentioned in the Specification, Schedule of Rates or on the drawings shall be deemed to mean the provision of the named product or process or an approved alternative.

SECURITY / HEALTH & SAFETY

2.1 Safety, Health and Welfare at Work legislation and regulations

The Contractor shall be deemed to have included in the Contract Sum for complying with the terms of the above. The Contractor shall be deemed to have included for the preparation of Safety Statements and Health and Safety Plans and for taking all steps necessary to ensure the safety of all persons likely to be affected by the execution of the works.

The Contractor shall incorporate in their Health and Safety Plan measures to deal with any hazards identified in the Barrack Safety Statement, a copy of which shall be made available on request.

The Contractor shall comply in all respects with the requirements of current legislation and Regulations with respect to his employees, specialists, domestic subcontractors, visitors and other third parties. The safety documentation shall be updated during the course of the Works to include any further hazards which may arise.

All statutory safety regulations shall be adhered to in respect of the erection of the structure and all reasonable care shall be taken as a precaution against accidents. The Contractor shall provide for the necessary labour and materials to meet those requirements.

The Contractor shall comply in all respect with the above Act and its subsequent regulations to include:

- Welfare Facilities
- Safety officers, supervisors, first aiders
- Protective clothing, safe pass cards, construction skills certificates scheme, etc.
- Site safety including pedestrian & traffic management, staff parking, suppliers, plant, machinery, power tools, site vehicle, sign lighting & guarding, scaffolding and working platforms, emergency procedures, etc.

2.2 Responsibility

Notwithstanding directions received from the ER, the Contractor is solely responsible for the safety of the Works.

2.3 Protection

The Contractor shall provide for the effective protection of the public, the Employer's Personnel, visitors, and all other persons occupying or using the site and these costs are deemed to be included in the Contract Sum.

2.4 Safety, Health & Welfare at Work (Construction) Regulations

The Contractor shall be deemed to have examined the Works Requirements, the site of the work and access thereto and to have included in the tender figure for all additional work or costs required to allow him carry out the work in compliance with the provisions of the Regulations.

2.5 The Project Supervisor for the Design Process

The Project Supervisor for the Design Process is as named in the Preliminary Safety and Health Plan – see Information Documents accompanying the tender documents.

2.6 Safety and Health Plan – Preliminary

The Preliminary Safety and Health Plan is included with the Information Documents. The Plan will NOT be included as a Contract Document.

2.7 Project Supervisor for the Construction Stage

The Project Supervisor for the Construction Stage (PSCS) shall be the Main Contractor appointed to carry out the Works.

Where a tenderer is not deemed competent by the Employer to act as Project Supervisor for the Construction Stage then the tender submitted by that party shall be passed over and deemed invalid.

In the event of the Employer deciding to enter into a contract for the execution of the Works, the successful firm shall enter into a contract (the 'Main Contract') using the Conditions of Contract as specified elsewhere. The firm shall also enter into a Collateral Agreement to the Main Contract for the provision of the service of Project Supervisor for the Construction Stage and the performance of the duties outlined in the above mentioned Regulations in consideration of the acceptance by the Employer of the tender, or any modification thereof.

The Form of Collateral Agreement shall be the Model Form published by the Department of Public Expenditure and Reform.

2.8 Safety File

Three copies of all information developed or obtained by the Contractor (except for Contract documentation issued to him by the ER) and relevant to the preparation of the Safety File for the project shall be handed over to the ER, on completion of the Works. Refer to Appendices for further information on required contents of the Safety File that the Contractor will be required to co-operate in the compilation of by providing relevant information in his possession.

The Contractor shall co-operate with the PSDP in the preparation of the Safety File and shall provide all relevant documentation in his possession, including all technical manuals and materials safety sheets. The Employer will be unable to take possession of the Works ('Substantial Completion' stage) unless he has received the information and documentation required to allow the Employer comply with his duties in respect of the safe operation of the premises under relevant statutory provisions.

2.9 Notification of the Health and Safety Authority

The notification of commencement of construction of the project to the HSA shall be the responsibility of the Project Supervisor for the Construction Stage - the Contractor.

2.10 'SAFEPASS' accreditation

The Contractor shall comply with the requirements of the construction industry's safety accreditation scheme, known as the 'Safepass' scheme.

2.11 Security

All Contractor's Personnel that the Contractor proposes to have attend site on a regular basis will be required to undergo Garda Vetting. The application process to be gone through shall be the same as that outlined in the tender documents in respect of the managing director of the tendering firm or the person designated as taking responsibility for the project.

Completed forms for Contractor's personnel shall be submitted to the Officer identified to the Contractor by the ER. From submission of the fully completed application, the clearance process may take a minimum of six working weeks but could be considerably longer depending on the capacity and workload of the Garda Central Vetting Unit at the time of the submission.

The clearance application process is a two-stage process requiring the initial submission of an outline application and evidence of identity to the designated Engineer for the project. On receipt by the applicant of an invitation, the online submission of all required details including names, details of parents, date of birth, history of residence and details of Court convictions (regardless of what any conviction was for).

Personnel may be allowed to access the site during the clearance process at the discretion of the military authorities responsible for the installation but will be denied access in the event of the vetting process leading to any person being deemed unsuitable to be allowed admission to a Defence Forces' establishment. Reasons for refusal of clearance will not be given.

The details of the personnel required on site by the Contractor during the first six weeks of the Contract shall be submitted to the designated Officer within TEN WORKING DAYS from the date of a letter requesting the details. Details shall be submitted on the application forms that will be issued to the Contractor, shall be fully completed and signed by the person for whom clearance is being sought and shall be submitted with the required evidence of identity.

The Minister or any of his officers shall have the right without condition to refuse admission to the site of the works of any person whatsoever. Should an employee of the Contractor be refused admission the Contractor shall provide a substitute employee, acceptable to the Employer and fully cleared for security purposes, in lieu thereof. The requirement for the exclusion of employee(s) shall be deemed to result from an 'act or omission of the Contractor' in accordance with the terms of Clauses 2.7 and 4.5.

The Contractor will be deemed to have included in his tender for all costs involved in complying with security requirements as described above and for taking all steps necessary should security clearance or access be denied to any person or firm.

Notwithstanding the fact that the work is to be carried out in a security aware area, the Contractor will have sole responsibility for protecting plant, materials, equipment and work executed against damage and theft.

2.12 Confidentiality of Project Details

All information that comes into the possession of the Contractor that is relevant to the security of the Defence Forces facility, where the project is located or the project itself shall be treated as confidential and shall not be divulged to any party except to the extent required to deliver the Works Requirements in accordance with the Conditions of Contract.

This obligation shall include information about the design of the Works, the nature of the intended use of the building or project being worked on, the use of adjacent buildings and facilities, access arrangements to the location and information about the operations conducted within that location.

Photographs of the location and of the work being carried out shall NOT be published without the prior written consent of the Employer, which shall only be provided in exceptional circumstances. This publication restriction includes reference to the project in promotion and advertising material prepared for or published by the Contractor.

Advertising signage or project information boards shall not be erected on the site or on the boundary of the facility the site is located in without the prior written approval of the Employer.

The confidentiality obligation shall extend beyond the Contract Duration and it shall be an implied term of the Contract entered into that the Contractor undertakes to comply with this obligation.

2.13 Photographs for Passes

Three passport sized photographs, or alternatively three copies of each person's Safepass card, (with the person's name and address on the reverse) shall be submitted to the party nominated by the ER to allow for the issue of Security Passes.

2.14 Private Security Authority Licence

All providers of security alarm installations and CCTV installations to the project shall be licensed by the Private Security Authority (PSA) in accordance with the provisions of the Private Security Services Act, 2004

2.15 Specific Safety Requirements

The Contractor shall liaise with the DFTC Safety Officer to ensure co-ordination between construction activities and those of other workers and personnel in the DFTC area.

2.15.1 Contractor's Personnel and Site Visitors

The Contractor shall implement an appropriate booking in and out system for all site operatives and visitors, which will be subject to the approval of the Client. All Contractor's Personnel and visitors to the site must co-operate with the client or his authorised representatives with regard to access and security.

2.15.2 Vehicular Hazards

Temporary signage, lighting and barriers must be erected to ensure the safety of all personnel from vehicular hazards.

2.15.3 Contractor's Deliveries

Contractor's deliveries must only be made at agreed times and must not disrupt normal road traffic. Avoid deliveries during peak times. Ensure that personnel are used to direct traffic during deliveries to the site. Delivery vehicles must be assisted while entering or leaving the site or manoeuvring on the roadway.

2.15.4 DryingtheWorks

Provide for all necessary equipment, fuel and attendance for drying the works as and when required.

2.15.5 Designers RiskAssessment

Appendix 'A' of the Preliminary Safety and Health Plan deals with Safety Statement requirements and the evaluation of risk assessed by the Project Supervisor Design Process as of the date of issue of the document. The Contractor's designer (including those of sub-

contractors) will be required to make the necessary risk assessments in respect of Contractor's design items and insert them before commencement of the appropriate section of the Works. Reference shall be made back to the Project Supervisor (Design Process) as design development or major changes to design occur.

The Contractor is to consider and make provision to minimise the identified risk and any other risk as may arise and be reasonably foreseeable during the construction phase. The Designer's list will not be an exhaustive list and the Contractor shall exercise due care and diligence throughout the Works together with continued liaison with the Project Supervisor (Design Process) as design development, major changes to design or design amendments that may affect Safety and Health arise.

2.15.6 Contractors MethodStatement

The Contractor shall provide the following statements prior to commencement of Works likely to involve any of the hazards listed. This is not intended to be an exhaustive list and the Contractor shall also develop the list as circumstances require:-

a. Site traffic management.
b. Liaison with BFW Electrical/Mechanical Staff, CIS Personnel, Military Police regarding the timing and relocation of services.
c. Working at height.
d. Working with asbestos.
e. Hot work.
f. Manual handling.
g. Minimising the risk of slips, trips and falls.
h. Protection measures necessary to safeguard eyesight, hearing respiratory systems, body parts.

2.15.7 Materials RiskAssessments

The Contractor is to provide risk assessments for all materials subject to control under the following statutory instruments applicable to construction sites.

a. Safety, Health and Welfare at Work (Carcinogen) Regulations 1993 S.I. No. 80.
b. European Communities (Protection of Workers) (Exposure to Asbestos) Regulations 1989 S.I.
c. No. 34 – amended 1993 S.I. 276.
d. European Communities (Protection of Workers) (Exposure to Lead) Regulations 1988 S.I. No. 157.
e. European Communities (Protection of Workers) (Exposure to Noise) Regulations 1990 S.I. No. 157.
f. European Communities (Protection of Workers) (Exposure to Chemical, Physical and Biological Agents) Regulations 1989 S.I. No. 251.
g. European Communities (Classification, Packaging and Labelling of Dangerous Preparations) Regulations 1995 S.I. No. 272.
h. European Communities (Classification, Packaging and Labelling of Dangerous Substances) Regulations 1994 S.I. No. 77.

The materials specified for use on this project are identified with the tender documentation. There is not an exhaustive list of general or particular material risks. The Contractor shall make his own assessment from the tender documentation or any future changes to the Works Requirements.

2.15.8 Site Rules

A number of specific site rules are brought to the attention of the Contractor. Variations or amendments to these must be agreed by ER and the Project Supervisor for the Construction Stage, otherwise they are to be applied to site operations in full. The Contractor shall draw up an appropriate list of rules covering site safety and personnel and submit it for discussion to the Project Supervisor for the Design Stage.

a. Define and maintain safe secure access to the site.
b. Do not impede access to neighbouring buildings at any time.
c. Fence off site from unauthorised access.
d. Appropriately, qualified and supervised personnel using specialist techniques designed to minimise the likelihood of inhalation of asbestos material (if present) by any persons or its dispersal will remove asbestos.
e. Allow for site access to maintain essential camp/barrack services, water, power, etc.
f. Fire prevention on construction sites.

Variations to the above will be accepted subject to an agreed procedure to ensure a satisfactory level of site control and safety management is maintained at all times. 'Agreed procedure' means a procedure that is acceptable to the ER.

2.15.9 SafetyandAvoidance of Nuisance

All work shall be performed in such a manner as to ensure the safety of the Works and the public and so as to cause as little inconvenience as possible to the public and adjoining buildings and their users. Debris shall be regularly watered to prevent the spread of dust. The Contractor shall be liable for any claims arising from failure to observe the above requirements.

2.15.10 Maintenance of Temperature and Humidity Levels

Provide for all necessary equipment, fuel and attendance for controlling and maintaining the specific temperature and humidity of the works as and when required. The Contractor may not use the permanent heating systems for drying out and maintaining necessary temperature and humidity levels.

2.15.11 Temporary Accommodation and Facilities for Employer

The Contractor shall provide suitable accommodation for Site Meetings.

2.15.12 Design of Temporary Works

The Contractor is to design and provide all necessary temporary works required to complete the project including but not limited to screens, stairs, hoists, guardrails, walkways, access ways, etc., all as set out or indicated in the Works Requirements.

2.15.13 Employment of Labour

The Contractor on the Works shall employ only fully qualified and competent tradesperson together with their necessary labourers or helpers and the whole of the same shall be carried out and completed in the best and most substantial manner. The ER shall have the power to exclude/remove from site any person who misconducts themselves or is incompetent or negligent.

3. CONTRACTUAL REQUIREMENTS

3.1 Conditions of Contract and Articles of Agreement

The Conditions of Contract will be the Public Works Contract for SHORT FORM OF CONTRACT (building & civil engineering) as published by the Department of Public Expenditure and Reform. The applicable version shall be that posted on the www.constructionprocurement.gov.ie website ten days prior to the return date for tenders. Further amendments to the published document are listed below.

3.2 Inconsistencies

In the event of there being an inconsistency between documents, the tenderer shall observe the order of precedence as set out in the Conditions of Contract (ref Cl 1.4). In the event of there being an inconsistency between figured and scaled dimensions, the figured dimensions shall prevail. All apparent inconsistencies shall be raised with and clarified by the ER before the Contractor orders materials or commences work.

3.3 Contract Date, Starting Date and Date for Substantial Completion

The date for Substantial Completion shall be the date arrived at after the time allowed for completing the works is measured from the Contract Date. The 'Starting Date' shall not be the basis of calculating the date for Substantial Completion.

The Contractor shall sign the relevant part of the Completion Certificate and include all support Ancillary Completion Certificates from specialist sub-contractors for which the Completion Certificate is relying on.

Notwithstanding any statutory duty to retain same, in advance of project completion, the Contractor shall issue to the Employers Representative/Assigned Certifier a copy of all inspection records retained by the Contractor during the course of the project.

The Contractor shall agree a programme with the ER for implementation for the training and Demonstration to the Employer's personnel as appropriate, in the purpose, function and operation of the installations including all items and procedures required. Two training demonstration sessions per system shall deemed to be included in the contract sum.

The Contractor must give to the ER at Substantial Completion, three copies of all manufacturers', suppliers' or sub-contractors' maintenance instructions together with all guarantees, warranties and such like as maybe provided.

3.4 Remedial Work during Defects Period

Items notified by the ER to the Contractor will be classified as detailed below and the Contractor must act as stipulated:

a. Very urgent defects to be made good immediately upon receipt of notification i.e. any work which causes a threat to safety including burst pipes, gas leaks, electricity failure, security problems and failure of heating or hot water.
b. Urgent defects to be made good within 24 hours of receipt of notification, i.e. any work which if delayed would cause additional damage or wear.
c. Routine defects to be made good within 7 working days of receipt of notification.

For defects within classifications (a) and (b), notification may be telephone, subsequently confirmed by email. A note of the time, date and person accepting the message will be taken and the time of the telephone message.

The Contractor shall advise in writing, within 24hrs of receipt of any notification, if any snag or routine defect cannot be rectified within the timescale detailed above (e.g. due to long lead in items).

Should the Contractor fail to rectify the defects within the period stated, the Employer reserves the right to instruct a selected Contractor to immediately correct the defects and to deduct any costs incurred from any sums due or to become due to the Contactor.

3.5 Tender documents only for intended recipient

Tender documents are intended for the specific party to whom they are intended to be issued.

3.6 Lowest or any other tender

The Employer shall not be bound to accept the lowest or any other tender and reserves the right to cancel the tender competition at any time.

In the event of the Employer deciding to accept a tender, the Contract shall be awarded on the basis of the lowest priced suitable tender (suitability refers to such items as capacity, organisation, experience, performance on previous contracts, financial standing relative to the Contract and compliance with any specifications or quality standards laid down for the Contract).

Tenderers shall not be reimbursed for the costs incurred in tendering nor, in the event of the cancellation of the competition, in preparing qualification and tender submissions.

Tenders deemed to be abnormally low may be excluded from consideration for award of the Contract. Where a tenderer, or any member of the tendering Group or Consortium, has supplied information that is inaccurate or false in relation to their submission, their tender will not be considered.

Where a tenderer, or any member of the tendering Group or Consortium, is the subject of any of the 'insolvency events' listed below before a Contract award is made, their tender shall be deemed to have been withdrawn and will be excluded from consideration when the decision on the award of the Contract is made.

a. A petition being presented to wind the tenderer up and not being dismissed within 14 days after presentation.
b. A meeting of the tenderer's creditors or members being held for the purpose of considering a resolution to wind it up.
c. The tenderer entering or proposing to enter an arrangement with or for the benefit of its creditors. A petition being presented to appoint an examiner to the tenderer.
d. A liquidator, examiner, supervisor, receiver, administrative receiver, trustee, encumbrancer, or similar being appointed for the tenderer or any of its assets.
e. The tenderer ceasing or threatening to cease its business.
f. The tenderer becoming insolvent or unable to pay its debts as they fall due.
g. The tenderer, being an individual, becoming bankrupt or dying or becoming incapable of performing this Contract.

Furthermore, tenders will not be considered where the tenderer, or any member of the tendering Group or Consortium, has been the subject of a conviction by final judgement for one of the following:

a. Participation in a criminal organisation, as defined in Article 2 of Council Joint Action 2008/841/JHA.
b. Corruption, as defined in Article 3 of the Council Act of 26 May 1997 and Article 2(1) and Article 2(1) of Council
c. Joint Action 2008/841/JHA.
d. Fraud within the meaning of Article 1 of the Convention relating to the protection of the financial interests of the European Communities.
e. Money laundering, as defined in Article 1 of Council Directive 2005/60/EC of 26 October 2005 on prevention of the use of the financial system for the purpose of money laundering.

The tender of any tenderer who is the subject of any of the 'insolvency events' listed below before a Contract award is made shall be deemed to be withdrawn and will be excluded from consideration when the decision on the award of the Contract is made.

a. A petition being presented to wind the tenderer up and not being dismissed within 14 days after presentation
b. A meeting of the tenderer's creditors or members being held for the purpose of considering a resolution to wind it up
c. The tenderer entering or proposing to enter an arrangement with or for the benefit of its creditors
d. A petition being presented to appoint an examiner to the tenderer
e. A liquidator, examiner, supervisor, receiver, administrative receiver, trustee, encumbrancer, or similar being appointed for the tenderer or any of its assets
f. The tenderer ceasing or threatening to cease its business
g. The tenderer becoming insolvent or unable to pay its debts as they fall due
h. The tenderer, being an individual, becoming bankrupt or dying or becoming incapable of performing this Contract.

3.7 Insurances

The Contractor shall indemnify the Minister for Defence against all claims arising from the execution of the works that are the subject of the Contract and shall maintain all necessary insurances for the duration of the Contract, all in accordance with the requirements of Clause 10 of the Conditions of Contract. The Contractor shall provide evidence to the Employer that all insurances required by the Conditions of Contract are in place prior to the commencement of work. The insurances shall be kept in place for the periods required by the Conditions of Contract.

The Employer's Liability and Public Liability levels of cover and excess shall provide the minimum levels of cover and excesses set out in the Schedule to the Form of Tender.

The 'All – Risks' insurance policy shall provide insurance cover of an amount not less than the total contract amount plus a minimum of 30% to allow for Value Added Tax, fees and site clearance costs. The 'All Risks' policy shall name the Minister for Defence as a 'co-insured'.

Particular attention is drawn to the provisions requiring the All-Risks and the Public Liability policies to name the Employer as 'co-insured' and for the Contractor's policy providing Employer's Liability cover to indemnify the Employer against the same liability that is provided by the policy for the Contractor.

Any tenderer asked to provide evidence of having, or being able to get, the required insurances shall be required, as a minimum, to provide a statement undertaking to procure the insurances immediately upon entering into a Contract and a further statement from a bona-fide insurance broker that such insurances will be available to the Contractor. A tenderer failing to meet this requirement shall be excluded from further consideration and their tender deemed to have been withdrawn.

Tenderers shall be required to have Employer's Liability insurance cover regardless of whether they directly employ labour or not.

3.8 Performance Bond

Not applicable

3.9 Currency to be used in Pricing the Works

All prices and rates shall be deemed to be denominated in Euros (€).

3.10 Schedule of Rates / Pricing Document

A fully priced and quantified Pricing Document shall be provided by the Tenderer. The total of the quantities shown multiplied by the rates tendered shall equal the tender sum offered. Failure to provide this information with the tender submission, or at latest within 5 working days of it being requested, may result in the tender being deemed invalid.

3.11 Publication of Tender Information

Tenderers are advised that the Employer is obliged to circulate the name and address of the Contractor awarded the work, the type of work involved and the address of the site to a nominee of the Irish Congress of Trade Unions (ICTU).
Submission of a tender shall be deemed to confirm the tenderer's acceptance that he agrees to the circulation by the Department of the above information. Any tender, which a statement stating or implying that the tenderer does not agree to the release of the above information, shall be deemed to have been dis-qualified and may be treated as an invalid tender accompanies.

3.12 Pay and Conditions of Employment

In order to be considered for the award of the Contract, a tenderer must confirm that their firm complies with its obligations under sectoral employment orders, employment regulation orders, and registered employment agreements. Where applicable, registered under the Industrial Relations Acts 1946 – 2015 and is also in compliance with the National Minimum Wage Act by completing the declaration included with the Tender Documents.
The tenderer must show that their firm is a fully paid-up member of the Construction Workers' Pension Scheme and Construction Industry Sick Pay schemes, or approved equivalents. Where employees of the firm are required to be members of them in accordance with the legal requirements covering workers employed in the relevant areas of the construction industry. A tenderer asked to do so shall promptly submit contribution receipts or other evidence of membership acceptable to the Employer. Any tenderer unable to provide evidence of being in compliance with their obligations may be deemed to have withdrawn his tender. A Contractor required to be a member of Pension and Sick Pay Schemes shall remain in membership of them for the duration of the Contract.
A tenderer claiming exemption from the requirement to be a member of the Pension and Sick Pay Schemes on the basis of not directly employing persons eligible for membership of them shall be obliged to provide a detailed proposal of how they intend to have the Works carried out, including how the required labour is to be sourced. Any tenderer proposing to subcontract the entirety of the Works shall be excluded from further consideration and their tender shall be deemed to have been withdrawn. A tenderer proposing to subcontract some elements of the work shall provide details of the planned extent of the subcontract arrangements. Where the arrangements are broadly acceptable to the Employer, commit to the intended subcontractors being in membership of the Pension and Sick Pay Schemes where the work to be so subcontracted falls within the scope of the sectoral employment orders, employment regulation orders, registered employment agreements, where applicable, registered under the Industrial Relations Acts 1946 – 2015.
Contractors may be subject to spot checking throughout the course of the Contract to ensure ongoing compliance with the requirements of the 'Pay and Conditions of Employment of Workers' PW CF6 Clause for all 'Contractor's Personnel', which shall include all persons employed on the delivery of the Works by the Contractor and their subcontractors. The Contractor shall be obliged to submit written confirmation with every payment application submitted of being in compliance with the requirements of the Contract Clause.

3.13 Prompt Payment of Accounts

The provisions of the European Communities (Late Payment in Commercial Transactions) Regulations 2002 concerning the prompt payment of amounts due in commercial transactions shall apply to all sums payable to or by the Contractor or any subcontractors or suppliers for work or items supplied for this project.

3.14 Materials, Workmanship and Equivalent Items

All materials used in the work shall be new and unused unless specifically required to be salvaged or re- used by the Contract documents.

Materials and workmanship shall be of the best quality and shall comply with all relevant Irish Standards and Codes of Practice or European Community Standards.

Materials shall comply with the requirements of the European Communities (Construction Products) Regulations, 1992.

Only fully qualified and competent tradesmen and helpers shall be employed on the Works. The ER must approve all Work sub-let or done by sub-contractors before commencement of the works.

All work shall be carried out within the tolerances specified in BS 5606. All works shall be inspected by the ER prior to covering up.

Wherever a proprietary name is used to specify a material or process it shall be deemed to have the term **'or equivalent'** appended to it.

Where a material or process is described by reference to its proprietary name, the name is used to indicate the standard of construction, appearance, ease of maintenance and durability acceptable to the ER. The ER will approve the use of alternatives where such alternatives are shown to equal or surpass the qualities of the product or process specified. Accordingly proprietary names wherever mentioned in the Specification, Schedule of Rates or on the drawings shall be deemed to mean the provision of the named product or process or an approved alternative.

Equivalence of the standards of any alternative product shall be verified by independent certification upon the Engineer's Representative (ER) request.

3.15 Programme

The tenderer is to provide a detailed construction programme with the Works Proposals accompanying the tender submission. The programme shall be in a bar chart format and include:

- Holidays / non-working days.
- Work sequencing
- Critical path
- Start / Substantial Completion / Milestone dates.
- Required programme contingency of Site Working Days as called for in Schedule part 1 to the Conditions of Contract.

The Contractor shall in all events ensure that the works are programmed, supervised and carried out in a way to minimise the risk of accidental interruption to live services.

3.16 Training of Employer's staff

Before Substantial Completion, or at a date thereafter agreed before Substantial Completion with the ER, explain and demonstrate to the Employer's maintenance staff the purpose, function and operation of the installations including all items and procedures listed in the Building Manual. Include for not less than two (2) operating days for this purpose. The Contractor shall ensure that full instruction to the Employer's staff is given to at least 3 nr individuals and is signed off as having been received.

3.17 Covid-19 Measures

The Contractor shall comply in full with relevant legislation and regulations made thereunder, Government published guidance and Public Health Measures related to the COVID-19 pandemic and current at the Designated Date for the project. 'Government published guidance' shall include relevant material published by its agencies and in particular the Health and Safety Authority and the Health Services Executive.

The Contractor is advised to take into account the Construction Industry Federation's Standard Operating Procedures issued with respect to the COVID-19 Pandemic.

The Designated Date shall be the date 10 days before the last day for receipt of the Contractor's tender for the Works.

The Contract Sum will be deemed to include for the implementation of all measures - including hygiene, access management, materials procurement and delivery, work sequencing and work practices - required to construct the work safely and to minimise the risk of disease contagion for the Contractor's Personnel, the Employer's Representative, Employer's Personnel and third parties visiting the site.

4. BUILDING CONTROL REGULATIONS AND SPECIALIST WORKS CERTIFICATION

4.1 Building Regulation Compliance

The Contractor's shall execute the works in full compliance with B(C) AR - Building Control Regulations. The Contractors tender is deemed to include all costs associated with his duties and obligations in this regard. There shall be no Local Authority involvement. All submissions shall be made to the party designated by the Director of Engineering.

4.2 Electrical Subsystems Certification

All electrical sub-systems shall be certified as having been carried out in compliance with the requirements of the ETCI Wiring Regulations.
Copies of the ETCI Subsystems certificates, accompanied by the relevant test results, shall be included with the ETCI Completion Certificate in the Health and Safety File for the project.
In the event of the Contractor failing to secure Subsystem certificates for all items of equipment, then the Contractor shall be liable for the cost of having the systems tested, remedied as necessary and certified. The tender figure shall be deemed to include for all costs incurred by the Contractor in providing the appropriate documentation.

4.3 Fire Certification and Marking

The Contractor shall, immediately prior to Substantial Completion, certify that the construction work carried out on the contract by him and his workers has been carried out in such a way as to ensure that the integrity of the fire zones within the building has been maintained. That all fire barriers, control elements, coatings and alarm systems have been provided and installed in compliance with the relevant Standards.
All fire resistant coatings such as intumescent paints shall be clearly identified with an engraved plate identifying the designed fire rating and specifying that no paint or other decorative coatings shall be applied to the coating without the prior agreement of the person with maintenance responsibility for the building. The locations for the plates shall be instructed by the ER.
All fire rated door-sets with non-metallic leaves shall be permanently identified in accordance with the requirements of BS 8214:1990 identifying the period of fire resistance, the manufacturer's name and address, the year of manufacture and other pertinent details. These details shall be engraved on a metal plate, fire resistant to 800^{O}C, which shall be fixed to the hinge stile of the door leaf near the top edge and shall be clearly legible. Every fire door (i.e. the complete fire door assembly) shall be supported by a fire test report from an accredited laboratory (see Technical Guidance Document D of the Building Regulations) that indicates that the complete assembly will meet the required performance.

5 TAXATION

5.1 Value Added Tax

The tender shall be submitted on the basis that the tender amount includes all VAT that the Employer will be obliged to pay to the Contractor. Any VAT to be paid directly to the Revenue Commissioners in accordance with the Reverse Charge VAT Regulations shall be excluded. Tenderers shall list separately the items included in the tender amount that are liable for VAT at rates other than the special building rate (13.5%) to allow for the calculation of the Employer's total VAT outlay on the contract. The Employer reserves the right to seek advice from the Revenue Commissioners on the accuracy of the VAT allocations shown and, in the event of a dispute, the opinion of the Revenue Commissioners on the VAT rate appropriate to any item of work shall be final.

During the Contract, payment amounts due to the Contractor shall be invoiced on the following basis:

a. The amount due to the Contractor that carries a VAT liability of 13.5% shall be invoiced separately from any other amounts due. This invoice shall be clearly marked with the statement 'VAT ON THIS SUPPLY TO BE ACCOUNTED FOR BY THE PRINCIPAL CONTRACTOR'
b. Amounts due to the Contractor that carry no VAT liability, or are liable at rates other than 13.5%, shall be invoiced on a second invoice that identifies amounts due at the various VAT rates (apart from 13.5%), identifies the VAT due at the various rates and states the total amount due for payment.

Applications for payment and valuations of Compensation Events shall identify the items of work that carry a VAT liability at rates other than 13.5%, stating the rate applicable. Where the cost of any items are VAT exempt or zero rated for VAT purposes the relevant items shall be itemised and the amount of the liability at this rate shall be clearly identified. In the event of a VAT liability arising for the Department on work or services provided by a party not registered for VAT in the Republic of Ireland. The invoices shall be submitted on a VAT exclusive basis and clearly marked to show that all VAT due on the supply will be returned by the Department directly to the Revenue Commissioners. Nonetheless, the Contractor will be required to provide all information required for the calculation of the VAT liability.

The tender shall include for Value Added Tax liability at the Standard (23%) rate only. No amount shall be included for the VAT liability at the special building rate (13.5%). Where the work is liable at various rates, the Contractor shall provide a detailed breakdown of the items of work liable at 23% and or 0% / exempt to facilitate the valuation of Change Orders. Where the cost of any items are zero rated / exempt for VAT purposes, the relevant items shall be itemised and the amount of the liability at this rate shall be clearly identified on the tender summary, with the amount carrying the zero rated / exempt liability kept separate in the compilation of the total tender price.

5.2 Tax Clearance Certification

The award of the Contract will be conditional on the selected tenderer being in a position to produce a valid 'Subcontractor's Notification of Determination' issued by the Revenue Commissioners' eRCT system. The Notice shall be not more than 30 days old on the date that the tenderer provides it to the Employer. Where the 'Notice' states that tax is to be deducted from the tenderer at the rate of 35% then the tenderer shall be deemed unacceptable for the award of the Contract and his tender shall be deemed invalid. A tenderer asked to produce a 'Notice' shall be allowed ten working days to do so after which, should he have failed to do so, he may be deemed to have withdrawn his tender. The tenderer shall be responsible for all costs incurred by him in obtaining a 'Subcontractor's Notice of Determination'. The Employer is obliged to withhold tax from the Contractor in accordance with the instructions of the Revenue Commissioners at the rate determined by them as appropriate for the Contractor at the time any payment is due to be made.

In addition to the Notice referred to above, a copy of the tenderer's Tax Clearance Certificate will also be required.

6. DEFINITIONS AND EXPLANATIONS

6.1 ER

The Employer's Representative, as per the Conditions of Contract and the Schedule thereto.

6.2 The Works

The term 'the works' shall mean the whole of the works intended to be executed under this Contract including all work by local authorities and statutory undertakings, unless expressly stated to the contrary.

6.3 Re-Use from Store

The term 're-use from store' shall be deemed to include for sorting through stored items, selecting suitable items, cleaning, packing or wrapping to prevent damage and transporting to the location of their incorporation in the Works and removing any protective covering.

6.4 Store for Re-Use

The term 'store for re-use' shall be deemed to include for taking down items, carefully removing from their existing location to prevent damage, packing or protecting as necessary, loading, moving to a suitable store and protecting; the selection of items for re-use and associated work will be included elsewhere.

6.5 Plugging

The term 'plugging' shall mean the provision and fixing of hardwood or other approved proprietary plugs. For locations where nailed fixings are required the Contractor may use a cartridge operated fixing gun or other approved mechanical fixing method. Under no circumstances must softwood plugs be used. Care shall be taken when fixing plugs to reinforced concrete to avoid damaging the reinforcement.

6.6 Change

A Change shall be deemed to be an alteration arising from an ER's instructions during the course of the Works about the extent or quality of the Works called for in the Works Requirements.

6.7 Abbreviations

The following abbreviations have been used in the Preambles and descriptions of items in the Works Requirements:

sm - square metre

smm - square millimetre

cm - cubic metre

cmm - cubic millimetre

g - gramme

kg - kilogramme

t - tonne

N - Newton

kN - kilo Newton

lt - litre

swg - standard wire gauge

SR - Irish Standard Recommendation

BS - British Standard Specification

BSCP - British Standard Code of Practice

exc - exceeding

ne - not exceeding

i.e. - included elsewhere

m - metre

fs - finished size

mm - millimetre

Nr. - number

C - degree Celsius

Units of measurement have been abbreviated as follows:

m - metre

hr - hour

m^2 - square metre

nr - number

m^3 -cubic metre

kg -kilogrammes

nr -number

6.8 Euro norms, Irish Standards, British Standards and British Standard Codes of Practice

All European, Irish and British Standards and Codes of Practice used refer to the current metric version of such standards or codes except where metric standards or codes have not yet been introduced. The version of each code or standard applicable on the designated date for the Contract will be the version applicable.

6.9 Supply Only

The term 'supply only' shall be deemed to include the cost of supplying the materials and goods, their delivery to site, unloading, storing, returning packages carriage paid and obtaining any credits therefore.

6.10 Fix

The term fix shall be deemed to include for the supply as well as the fixing of the item mentioned.

6.11 Fix Only

The term 'fix only' is defined as the fixing of materials and goods where the materials and goods are either supplied to the Contractor free of charge by the Employer or where the supply of the items is dealt with elsewhere in the Specification document included with the Works Requirements. In addition to fixing the materials and / or goods, the Contractor will be deemed to have included for taking delivery of the items and safeguarding them. all handling required to get the items to the location of their incorporation in the Works, in accordance with the specific instructions (where provided) for the items and best industry practice. Protecting them and disposing of any waste except where unused materials is specified as being returned to the Employer in which case the surplus shall be returned to the Employer at the earliest possible opportunity.

6.12 Timber Sizes

All joinery and timber sizes quoted in this document are finished sizes unless otherwise stated.

APPENDIX A

SAFETY DOCUMENTATION REQUIRED FROM CONTRACTOR TO BE SUBMITTED PRIOR TO COMMENCEMENT OF WORK ON SITE

a. Identification of hazards associated with the work to which the tender relates including working from heights, excavations, fire, access and egress, etc.

b. Assessment of the risks associated with the hazards listed and the prevention and control measures to be implemented to combat these risks.

c. Training to be provided to staff to deal with the risks identified.

APPENDIX B

TYPICAL INFORMATION REQUIRED TO BE HANDED OVER TO THE EMPLOYER'S REPRESENTATIVE ON COMPLETION OF THE PROJECT AND TO BE MADE AVAILABLE TO THE PSDP TO ALLOW COMPILATION OF THE SAFETY FILE

a. Identification of and locations of all potentially hazardous materials (eg certain insulation materials, two pack and other special paint coatings) and installations and the procedures to be followed in order to minimise the associated risks:

   i) in the daily use of the building or structure

   ii) when maintenance, repair, refurbishment or replacement of the materials or installations is to be undertaken.

b. Marked up construction drawings showing how the work was-built where it differs from the requirements shown on the drawings issued to the Contractor. Information may be provided in the format of drawings marked up by hand in sufficient detail to allow the design staff to prepare the 'as built' drawings.

c. Specifications and details of pipe and cable run layouts and fixed systems. Information may be provided in the format of drawings marked up by hand in sufficient detail to allow the design staff to prepare the 'as built' drawings.

d. Details of fixed equipment and systems including charts and manuals specifying the operating procedures and maintenance requirements and procedures.

e. Test and commissioning certificates for mechanical and electrical installations installed or altered as part of the Works.

f. Design criteria, where design work formed part of the Contract, for structural elements and for electrical and mechanical systems.

Details of existing services and utilities encountered - either underground or in buildings - during the course of the Works, stating their location and describing them.

SECTION B

MATERIAL AND WORKMANSHIP GENERAL SPECIFICATIONS

CONTENTS

7. General

8. Demolitions

9. Concrete

10. Brickwork and Blockwork

11. Roofing

12. Woodwork

13. Metalwork

14. Glazing

16. Floor, Wall and Ceiling Finishes

17. Painting and Decorating

18. Drainage

19. Site-works Generally

20. Paving and Landscaping

7. GENERAL

7.1 General

Fire Safety works to Pearse Officers Mess, Pearse Barracks, DFTC, Curragh Camp, Co. Kildare. Specifications as per Section C Detailed Requirements.

7.2 Hoarding

Provide, install and maintain a secure site timber hoarding/metal hoarding as described earlier where indicated on site location drawing. The hoarding shall be painted with two coats of oil paint or as specified earlier –see section A and any necessary priming or undercoats to the Employers Representative's requirements. Provide and maintain adequate lighting to the hoarding as required. Secure access gates in the hoardings shall be provided.

8. DEMOLITIONS

8.1 General Requirements

Demolition work shall be carried out in accordance with British Standard Code of Practice B.S. 6187:2011 Demolition. Notwithstanding the provisions of this Code of Practice, the work shall be carried out in accordance with all Statutory requirements, including those of the Dangerous Buildings Section of the Local Authority and the Health & Safety Directive EC No. 276 : 1993 : Protection of Workers Exposed to Asbestos.

The order and method of each operation is to be submitted to the Employers Representative for approval prior to commencement. This is to include proposed methods of propping, shoring, protection of adjoining areas. Notwithstanding any information given in the Contract Documents, the onus shall be on the Contractor to visit the site of the works and satisfy themselves as to the nature and extent of the work and all other matters that might influence his price or time for completion of the works.

The Contractor shall be deemed to have examined the existing structures on the site and to have acquainted themselves with such matters as may affect the proposed demolition and the conditions under which they have to be executed. In particular the Contractor shall take cognisance of the proximity of existing buildings on the site and properties adjacent to the site as well as adjoining boundary structures, Main Square and road network.

8.2 Order and Execution of Works

The order of demolition, the manner of execution of work, as well as the temporary storage on site and subsequent removal of debris from site shall be agreed with the Employers Representative prior to the commencement of any demolition work.

8.3 Taking Down

All taking down shall be done in the most careful manner and is to cause as little inconvenience as possible. The Contractor shall be held responsible for any claim which may arise due to negligence or lack of adequate precautions on his part.

8.4 Concrete Slab/Floors

Prior to the demolition of any portion of a concrete slab the slab shall be examined by the Contractor in conjunction with the Employers Representative to determine the form of construction and the extent and sequence of propping

and demolition shall be agreed. If required small trial holes shall be cut out to determine the direction of the main reinforcement. The method to be used for breaking out the slab shall be agreed with the Employers Representative.

8.5 Coring, Demolish Required To Complete The Project

Carry out all demolitions in accordance with the requirements of BS 6187:2011. Tenderers must visit the site to ascertain the extent of the demolitions and alterations, the conditions under which they will be done and the nature of the structure being worked upon. Tenders will be deemed to include for all factors affecting the work. All debris associated with the demolition work is to be removed off site at the contractor's expense. All structural members to remain are to be protected during the works.

8.6 Protection To The Structure During The Works

Provide protection to the existing doors that are to remain, windows while work is been carried out. In particular the existing door access units are to be protected from dust and damage. Any protection shall be agreed with the Employer's Representative prior to the works been undertaken. The Contractor shall be responsible for any damages to the structure during the course of the works.

8.7 Surrounding Property

Should any loss, damage or injury occur to roads, underground services or surrounding property from the carrying out of the works, make good same at his own cost to the entire satisfaction of the Employers Representative and any other parties concerned and shall indemnify the Employer against any claims which may arise in consequence of such damage or injury.

8.8 Safety

All work shall be performed in such a manner as to ensure the safety of the work and the public. Demolition work to be carried out in such a manner as to cause the minimum inconvenience to the public and to adjoining military properties/buildings. All necessary precautions to be taken to minimise nuisance arising from demolition work. Submit proposals for carrying out the works in a safe manner and these shall be agreed prior to commencing any works on site.

8.9 Supervision

Demolition work to be carried out under the supervision of a responsible person experienced in demolition work who shall ensure that adequate safety precautions are taken at all times, and that all necessary statutory regulations are fully adhered to.

8.10 Explosives

The use of explosives for demolition shall not be permitted.

8.11 Burning

Do not burn on site materials arising from demolition.

8.12 Dust

All debris derived from the demolition must be wetted at frequent intervals to prevent dust arising. Debris shall not be permitted to accumulate on site and must be taken away and deposited in a suitable dump by the Contractor at the earliest possible time.

8.13 Nuisance

Take the necessary precautions to minimise nuisance arising from demolition work. See noise threshold level in General Requirement Section A.

8.14 Protection

All reasonable precautions shall be taken to protect adjoining work from damage during demolition work and temporary screens and coverings to be provided as required. Adjacent structures shall be protected from damage and shall be provided with adequate support at each stage of demolition. Do not disturb adjoining structures or their foundations.

8.15 Temporary Support

During demolition, any walls which are to be left in place for any period of time before demolition, and which have had their supporting roof removed, are to be adequately braced until demolition occurs. Contractor shall provide and maintain all necessary temporary support work. The Contractor shall be responsible for the design of all such temporary support work.

8.16 Overloading Floors

To avoid over-loading on any part of the building debris or materials shall not be piled to a depth greater than 300mm.

8.17 Overloading Boundary/Party Walls/Basement/Structural Walls

All surrounding boundary/party/basement/structural walls are to be protected against overloading or accidental damage during demolition. The use of heavy equipment close to the retained party / boundary/basement walls is to be restricted to ensure that none of these walls are overstressed during demolition. The walls adjoining the adjacent rooms are to be removed very carefully assuring no distress is caused to these adjoining room. Contractor shall ensure in particular that existing walls are not overstressed during the demolition operation and that no distress is caused to adjoining walls or the existing foundations arising from those operations.

Before starting demolition work, disconnect any services adjacent to that part of the area scheduled for demolition. Pay all charges for disconnection of services. Remove any tanks and pipes which may have contained inflammable liquids and gases in accordance with B.S.6187:2011. Retain and maintain existing services where servicing adjoining or adjacent properties.

8.18 Workmanship – Defects

Notify the ER of any apparent structural defects or decay uncovered before or during demolition work in parts of the structures to be retained.

8.19 Negligent Work

The Contractor shall be responsible for the repair of any damage caused by his own negligence and no payment shall be made by the Employer to the Contractor for rectifying any such damage.

8.20 Ordnance Survey Marks

Notify the Employers Representative of Ordnance Survey Marks found on structure elements scheduled for demolition. Do not remove or destroy such marks unless instructed.

8.21 Construction and Demolition Waste

The construction and demolition waste from the projects shall be recycled in accordance with 'Best Practice Guidelines on the Preparation of Waste Management Plans for Construction and Demolition Projects' published in 2009 by DOECLG. All waste disposal shall be in accordance with the Waste Management (Amendment) Act 2001 and the Protection of the Environment Act 2003.

Only licenced hauliers and licenced landfill sites are to be used. Materials and debris arising from site clearance and demolition work shall become the property of the Contractor unless so otherwise specified. Remove from site debris and other materials arising from demolition. Construction and Demolition Waste shall be disposed of in accordance with EPA and Local Authority guidelines.

9. CONCRETE

9.1 CEMENT

The cement shall be medium setting artificial cement, manufactured in Ireland, and shall comply with the Irish Standard Specification Portland Cement No. IS EN 197-1. The cement shall be delivered on the site in packages with unbroken seal affixed by the manufacturer. The cement shall be stored in such a manner that it will be efficiently protected from moisture.

9.2 SAND AND GRAVEL

The sand shall be gritty and clean, free from clay, organic or other impurity. It shall be graded mixture of coarse and fine grains, and shall be capable of passing through a sieve of one eighth of a square inch mesh. Should the Employer's Representative consider the sand is not clean and free from impurities when it is delivered to the works, he shall have power to order it to be washed in a manner approved by him. No sea sand is to be used. The coarse aggregate may be either clean crushed hard stones or clean gravel, free from dirt and impurities. In either case, it shall be coarser than 5mm and shall be graded from this size to a maximum of either 18mm or 38mm as specified for the different classes of concrete which follows. The coarse aggregate shall be graded between these sizes to the satisfaction of the Employer's Representative, and each particle must be sound and strong. All or part of the coarse aggregate shall be washed if the Employer's Representative decides it is necessary. Aggregates shall comply with BS 882.

9.3 CONCRETE

The structural elements of the Contract have been designed in accordance with current relevant Irish and British Standard Codes of Practice.

9.4 MATERIALS

All materials shall comply in all respects with the requirements of the appropriate Irish or British Standard.

Methods for specifying concrete	IS EN 206
Ordinary Portland cement	I.S. 1
Aggregates	IS EN 13242

9.5 READY MIXED CONCRETE

Ready mixed concrete may be used, subject to approval. The concrete shall comply with IS EN 206, except where stated in the specification. All delivery notes shall be retained by the Contractor and made available for inspection throughout the duration of the contract. One copy shall be issued to the Employer's Representative. All the constituents for each mix shall be added at the manufacturer's depot. No extra water or other materials shall be added after the concrete has left the depot.

The total amount of soluble salts in the concrete from the aggregate water and admixtures shall not exceed the recommended values of BS 8110. Each delivery of ready mix concrete must be accompanied with a docket containing the following information:-

1. Name of Ready-Mix Plant.
2. Serial number of docket.
3. Date.
4. Delivery truck number.
5. Name of purchaser and contract.
6. Grade of concrete.
7. Workability.
8. Maximum aggregate size.
9. Time of loading at plant.

9.6 AGGREGATE

General: Aggregate shall comply with IS EN 13242 unless otherwise specified.
Aggregates shall be stored on hard paved self-draining areas or in approved hoppers or containers. Different aggregates shall be kept separate.

9.7 WATER

Water shall be clean and free from harmful matter. If water for the Works is not available from a Public Utility undertaking supply, approval shall be obtained regarding the source of supply and manner of its use. When so directed, arrange for tests of the water to be carried out in accordance with BS EN 1008:2002.

9.8 CONCRETE

Concrete Mixes: Designed mixes shall be used for each grade of concrete listed in Table 1 and shall be in accordance with EN 206 except that the Contractor shall obtain approval for any change in sources of material and change in cement content which results in a difference greater than 20 kg/m^3 from the cement content last approved. Trial Mixes: Results of all preliminary tests shall be submitted as soon as they are available and before concrete work starts on site. Re-determination of Mix Proportions: Mix proportions may be adjusted in accordance with 6.7.6 of BS 8110, but changes of current margin shall be subject to approval.

9.9 CLASSIFICATION OF CONCRETE MIXES

Where the concrete mix is designated by the Employers Representative as a "designed" mix the Contractor will be responsible for selecting the mix proportions to achieve the required strength and workability but will ensure that the minimum cement content is adhered to.

DESIGNED CONCRETE MIXES – Table 1

Concrete Grade	Characteristic Compressive Strength at 28 days N/mm^2	Minimum Cement content Kg/m^3	Maximum size of Aggregate mm	Slump mm	Max Free water v Cement ratio	Location
10	10	180	20	75	N/A	Concrete blinding and mass concrete filling
20	20	220	20	75		Concrete bedding to pipes, manhole floors
20	20	260	20	75-125	0.65	Mass Conc. Foundations
30	30	260	20	50-100	0.65	RC Foundations
30	30	300	10	50-100	0.65	Topping screed
35	35	320	10	50-100	0.60	

9.10 MAXIMUM CEMENT CONTENT

Cement contents in excess of 550 kg/m^3 shall not be used unless as instructed or allowed by the Employers Representative.

9.11 ADMIXTURES

Admixtures may be used in "special" structural concrete but only with the prior approval of the Employers Representative. Admixtures, unless specified will not be permitted in prescribed mixes. Calcium chloride and admixtures containing calcium chloride will not be permitted. Both the amount added and the method of use should be to the approval of the Employers Representative who will be provided with the following data:-

(1) The typical dosage and the detrimental effects, if any, of under dosage and over dosage.
(2) The chemical name(s) of the main active ingredient(s) in the admixture.
(3) Whether or not the admixture contains chlorides and if so, the chloride on content expressed as a percentage by weight of admixture.
(4) Whether or not the admixture leads to the entrainment of air when used at the Manufacturer's recommended dosage.

An admixture shall be specified as one that complies with the requirements of the following British Standards: EN 12878 and EN 934, EN 480.

9.12 MIXING

The quantity of cement, the quantity of fine aggregates and the quantities of the various sizes of coarse aggregate shall be measured by weight only. A separate weighing device shall be provided for weighing the cement. The amount of water shall be measured by volume or weight. Any solid admixtures to be added shall be measured by weight only, but liquid or paste admixtures shall be measured by volume or weight.

The batch weight of aggregates shall be adjusted for the moisture content of the aggregate being used. The quantity of water contained in the aggregates shall be determined by the Contractor in accordance with a method approved by the Employers Representative and the quantity of water to be added to the mix shall be reduced by

the quantity of water contained in the aggregates being used.

The accuracy of all measuring equipment shall be within 3% of the quantity of cement, water or total aggregates being measured and within 5% of the quantity shall be maintained by the Contractor in a clear serviceable condition. The mixer shall comply with the requirements of B.S. 1305. The mixing time shall not be less than two minutes or the time necessary to ensure compliance with the required strength.

9.13 RECORDS

Keep a record of all concreting carried out on the Site. Record sheets shall be set out as follows:-
Date, Time, Temperature, Volume, Position, Remarks. These record sheets shall be available for inspection by the Employers Representative at every Site Meeting or at any other occasion so required by the Employers Representative.

9.14 TEMPERATURE

Provide a permanent Site Thermometer and shall record the temperature regularly. The minimum temperature at which concrete may be cast shall be:-

2°C on a rising thermometer or
3°C on a falling thermometer

Ensure that the temperature of the concrete is a minimum of 5°C at the time of placing. The maximum temperature at which concrete may be cast shall be 30°C.

9.15 TRANSPORTING OF CONCRETE

Transport concrete to avoid adulteration, segregation or loss of ingredients. The interval between mixing and placing shall be kept as short as possible. In all cases concrete should be finally placed within 30 minutes of discharge from mixer or from delivery vehicle. Concrete which has partially set shall not be placed in the work.

9.16 PLACING OF CONCRETE

The method of placing the concrete shall be of such that contamination, segregation or loss of the constituent materials does not occur. Before concrete placing commences all formwork and reinforcement contained in it shall be clean and free from standing water, snow or ice.
CONCRETE SHALL NOT BE PLACED IN ANY PART OF THE STRUCTURE UNTIL THE EMPLOYERS REPRESENTATIVE'S APPROVAL HAS BEEN OBTAINED.
If concreting has not started within 24 hours of approval been given, approval shall again be obtained from the Employers Representative.

The concrete while being placed shall be rammed, tamped, or mechanically vibrated to form a dense material with all surfaces free from honey-combing and other blemishes. The concrete shall be placed directly in its permanent position and shall not be worked along the shuttering to that position. Care must be taken to ensure that reinforcement is not displaced from its correct position during the placing of the concrete. Care shall also be taken to ensure that the reinforcement is fully surrounded by concrete, that no voids or cavities are left and that all steel shall have the minimum specified cover. A competent steel fixer shall be in attendance to correct any reinforcement displaced by the concrete operation.

9.17 VIBRATING OF CONCRETE

All concrete shall be compacted by means of high frequency internal vibrators of a type, size and number approved by the Employers Representative. The number of vibrators employed shall be ample to consolidate the incoming concrete to a proper degree within fifteen minutes after it is deposited in the forms. In all cases, at least two vibrators shall be available at the site of structures in which more than 20 cu. metres of concrete are to be placed (one on standby).

The vibrators shall not be attached to or held against the forms or the reinforcing steel. The location, manner and duration of the application of the vibrators shall be such as to achieve maximum consolidation of the concrete, freedom from voids and proper texture of exposed surfaces when the forms are removed. Fresh concrete shall be spread in horizontal layers in so far as practicable and the thickness of the layers shall not be greater than can satisfactorily be consolidated with the vibrators.

The use of vibrators for extensive shifting of the mass of fresh concrete deposited will not be permitted. Concrete shall be placed as near as possible to its final position. In no case shall concrete be over-vibrated.

9.18 SLUMP TEST EQUIPMENT

Provide a slump cone, tamping bar and base plate all in accordance with EN 12350-1 and facilitate the Employers Representative in carrying out slump tests to determine the consistency of the concrete.

9.19 HOLES AND CHASES IN CONCRETE

Holes, chases and other openings required for the passage of pipes, conduits etc., shall be formed by inserting suitable sleeves, cones and sinkings before placing the concrete. The Subcontractors shall be required to furnish full information in regard to the position of bolts, clips and other fastenings. The cutting of chases, holes or other openings in the finished work shall not be permitted without the sanction of the Employers Representative. Such holes and chases shall be made only in approved locations and shall be cut with approved tools.

9.20 CONCRETE SCREEDS

Surfaces to receive screeds shall be cleaned off and free of debris, oil, grease and dust. For screeds less than 50mm thick the concrete surface shall be mechanically hacked to expose the aggregate, washed and brushed clean. Not less than 12 hours later any surplus water shall be removed and a cement and water grout brushed onto the surface just ahead of the application of the screed.

Where screeds are greater than 50mm thick it is not necessary to expose the aggregate but the same cleaning and grouting procedure should be followed. Where an un-bonded construction is required the screed shall be laid on an isolating membrane. Screeds with a nominal thickness greater than 40mm shall be laid in two layers with the lower layer thickest and neither more than 20mm thick. The upper layer shall be laid and compacted immediately after the one below.

Screeds to receive thin sheet or tile finishes shall generally be laid in room sized bays. The position of day joints, if required, shall be to the ER's approval. Screeds to receive in-situ, tile, slab or block finishing's or heating elements shall be laid in square bays not exceeding 15 square metres. At least 24 hours shall elapse between the laying of adjacent bays and bays should be laid to break joint.

Movement joints in the slab should be continued through the screed. Screeds shall be kept damp for seven days by covering with polythene sheet and no traffic should be allowed over the screed for that period. The screed shall then be allowed to dry out naturally without the use of artificial drying aids.

9.21 REINFORCEMENT

Cold worked high yield steel bars with a characteristic strength of 500 N/mm2. Complying with the BS 4449.T:

Bars to be deformed to conform to Type 1 of Appendix E of BS 8110. Cold worked deformed bars to Type 2 Appendix E of BS 8110 shall also be permitted.

Steel fabric shall comply with BS 4483 and shall be delivered to site in flat sheets.

9.22 CONCRETE BLOCKS

Concrete blocks shall be composed of 14mm concrete of limestone aggregate and cast in approved concrete block machines twenty-eight days before building into walls in 440x215x105, or other suitable sizes. If considered necessary, sample blocks may be taken for testing and if, after twenty eight days from manufacture, they do not withstand a 7N/mm2 compression test, all blocks should be removed from the site and the cost of the test paid for by the Contractor. No block with broken arises or angles shall be used. The blocks shall comply with EU Construction Products Regulations 2013.

10 BRICKWORK AND BLOCKWORK

10.1 Materials

Materials shall comply with the following specifications:

Concrete blocks	- IS EN 771-3
Concrete bricks	- IS 189
Calcium silicate bricks	- IS 190
Clay bricks and blocks	- IS EN 772 & IS EN 771-1.
Insulating blocks	- BS 2028, 1364
Cement	- IS EN 197-1
Sand	- IS EN 13139
Lime	- IS EN 459-1
Water	- IS EN 1008
Mortar	- IS EN 1996-1
Mortar plasticisers	- IS EN 934-3 & BS 4887
Wall ties	- IS EN 1996-1 & IS EN 845-1
Damp-proof courses:	
Bitumen and polythene	- IS 57
Lead cored bitumen	- BS 743
Clay flue liners and terminals	- IS 51
Fire bricks	- BS 1758, 3056
Colouring mixtures for mortars	- BS 1014
Pigments	- IS EN 12878
Fibre cement cavity closer slates	- BS 690
Expanded metal	- BS 405
Polystyrene slabs	- BS 4483
Two part joint sealant	- BS 4254

10.2 General

Unless specifically instructed otherwise, either in this specification or on the drawings, loadbearing brickwork and blockwork walls shall be constructed strictly in accordance with IS EN 1996, Euro code 6 – Design of Masonry Structures. The contractor shall be responsible for the stability of all wall until such time as restraint is provided by the permanent structure.
Note:
In general all walls will be unstable until they are restraint at their heads and returns by the complete structure.
The contractor shall be fully responsible for the cost, design and safety of all shoring, scaffolding and temporary works.
No clay bricks or block shall be fixed in the works until they are at least 7 days old.
Concrete brick or blocks shall be at least 28 days old.

10.3 Stacking and Storing Facing Bricks and Blocks

Blocks and bricks for facing work shall be stored on a raised clean platform, protected from damage and staining and kept dry during delivery and before use and protected at all times from weather and damp.

10.4 Laying Bricks and Blocks

Brick and blockwork shall generally be carried out in compliance with BS 5628-3 and EN 1996. The stability of walls shall be ensured during their erection. No work should be carried out while the temperature is below 2 degrees centigrade on a rising thermometer or below 5 degrees centigrade on a falling thermometer. Walling shall be built in level lifts, no one portion being raised more than 1200mm above the general level. Bed and vertical joints shall average 10mm thick. No four courses shall rise more than 40mm above the height the block or bricks would rise if laid dry. Joints shall be fully filled.

10.5 Ducts, Channels, Openings Etc.

Ducts, channels, openings and the like in walling shall be formed as the work proceeds. It is the responsibility of the Contractor to ascertain their position before executing the work and no extra payment for doing the work retrospectively will be considered should he fail to do so.

10.6 Jambs

Blocks with integral cast-on nibs shall be used to close cavities where available. Where blocks with nibs are not available cavities shall be closed with cut or broken lengths of block carefully laid to maintain the bond on one leaf and butted against the back of the other leaf with a damp proof course interspersed where required. Particular care shall be taken in fair faced work to maintain the appearance and blocks shall be saw cut with the return carefully pointed to match the face work.

Where hollow blocks in excess of 100mm thick are being used in the leaf returned to close the cavity every alternate course shall be closed with a length of 100mm thick solid blockwork cut to width of the cavity. Blocks shall be saw cut and carefully pointed to match the face work in fair faced work.

10.7 Joints

Mortar shall be struck off to leave neat joints. Joints in masonry to be raked out to give recessed joints.
Existing blockwork to receive a plastered or rendered finish shall be slightly raked out to provide a key for the finish. Where wall opes for doors or windows have to be created or reduced, all new brickwork or blockwork shall be correctly bonded into the existing brickwork or blockwork. All new brickwork and blockwork laid must match the existing work.

10.8 Damp Proof Course

Damp proof courses (DPC) shall be manufactured from polyethylene. They shall be laid in a continuous strip on a full bed of mortar for the full width of the wall or for the full width of each leaf in a cavity wall. They should be lapped 150mm at all joints and for the full width at angles and junctions.

A DPC shall be provided:-

1. Above all openings in external walls, spanning the cavity and extending at least 100mm beyond both ends of the lintel. The D.P.C. shall step down across the cavity to form a cavity gutter and shall be carried through to the outer face of the wall.

2. In the jambs of all openings in external cavity walls, set in vertically in a continuous strip.

10.9 Movement Joints

Joints shall be pointed with the material specified in the chosen colour, used strictly in accordance with the manufacturer's instructions. Joints shall be true to line in either the vertical or horizontal direction as appropriate.

10.10 Bond

All blockwork and brickwork shall be laid in stretcher bond unless otherwise shown.

10.11 Joint Thickness

Horizontal Joints: joint thickness plus/minus 3mm combined thickness in any 1m height plus/minus 10mm.

Vertical Joints: joint thickness plus/minus 3mm combined thickness in any 3m length plus/minus 10mm.

10.12 Level of Bed Joints

The permissible deviation for bed joints from the nearest horizontal reference level shall be plus/minus 10mm.

10.13 Cutting and Fitting

Cut and fit blockwork and brickwork neatly to the line and profile of parts of the structure which the walling abuts or surrounds.

10.14 Mortar Beds

Mortar shall comply with IS EN 1996-1. The mortar strength shall be appropriate to the exposure conditions of the wall in accordance with IS EN 998-2 2016. For passive or moderate exposure, mortar below DPC level shall be strength class M6 and mortar above the DPC level shall be strength class M4. In situations where there is a high risk of saturation and freezing, the mortar shall be strength class M6 or higher, annex B of IS EN 998-2 2016 refers. Lay solid blocks and bricks on a full bed of mortar and with bed and vertical joints fully filled to a consistent thickness.

10.15 Ready Mix Mortars (Lime & Sand)

Ready mix mortars shall (coarse mix) maybe used provided that the materials, mixing and the like complies with this specification and prior approval has been given by the Supervising Engineer.

10.16 Bonding Generally

Lay blocks and bricks with cross joints (Flemish Bond) in any course not less than quarter of the length of the unit from those in the course below. Bats shall be used only where required to obtain bond.

10.17 Bonding Provision for Future Work

Leave toothing to provide for the bonding of future work. Weather tops of projections with mortar.

10.18 Bonding to Existing

Form toothing in existing work to provide adequate bond for new work.

10.19 Ducts, Channels and Openings

Form ducts, channels and openings in walling as the work proceeds.

10.20 Protection

Keep dry each lift of blockwork including the top surfaces until the commencement of the next lift or other superimposed work.

10.21 Weep Holes

Form weep holes at 1m c/c where cavity trays are used at lintels, abutments etc at the base of the cavity.

10.22 Wall Ties, Setting

Set wall ties in mortar joints to a depth not less than 50mm in each leaf.

10.23 Wall Ties at Openings

Wall ties shall comply with IS EN 1996-1 & IS EN 845-1. They shall be flat twist stainless steel unless noted otherwise in this specification or on the drawings. Provide wall ties at openings at centres not exceeding 225mm vertically.

10.24 Precast Lintels

Factory Manufactured precast concrete pre-stressed lintels are to be fitted over new door opes broken out as required and detailed on drawings.

10.25 Concealed Precast Lintels

Concrete: To BS5328, Grade C25 or higher, maximum nominal size of aggregate 20mm

Clear Span	Section	Bearing	Reinforcement
Up to 900mm	150mm deep x width of wall	150mm at each end	1nr 12mm mild steel bar for each 105mm of wall thickness
900 to 1,800mm	225mm deep x width of wall	225mm at each end	1nr 16mm mild steel bar for each 105mm of wall thickness

Minimum nominal cover to reinforcement shall be 20mm.

For greater spans and/or greater than normal loadings, see detailed drawings or obtain instructions.

10.26 General Requirements

Moulds must be:

- Constructed accurately to give straight, square and true components.
- Permissible deviations on length +0, 6mm, other dimensions, 1/3mm.
- Maintained in clean, sound condition and inspected carefully for defects before each reuse.
- Constructed to prevent loss of grout.
- Designed to permit demoulding without damage to the components.
- Coated evenly a suitable release agent, which must not be allowed to touch the reinforcement.

Damaged moulds must not be repaired and reused if this would impair the surface appearance of the components.

10.27 Concrete Generally

Constituent materials, composition of mixes, production of concrete, information to provide, sampling, testing and compliance to be in accordance with BS 5328 unless otherwise specified.

10.28 Aggregates

Unless otherwise specified: Aggregates to comply with IS EN 13242 and Annex E of SR 21.
Water absorption to be not more than 5% measured in accordance with BS 812: Part 2.

11. ROOFING

11.1 ROOFING TIMBERS

Timber shall be sound, well-conditioned, properly seasoned to suit its intended use and free from defects rendering it unsuitable for its proposed use. It shall be free from all loose and unsound knots, pitch pockets, woodworm and decay. All carpentry work shall be executed in a workmanlike manner with all joints, fixings and methods of fixing being the most appropriate for the work. Timber shall be stress graded softwood shall be graded in accordance with BS.4978, comply with IS EN 1995 and be as follows:-

LOCATION	STRENGTH CLASS	ORIGIN	GRADE

Roofing and Ceiling Members	C16	Home-grown	SS

The strength grade shall be stamped on the timber. All timber used shall be treated with preservative and it shall comply with the following:-

a. Pressure Impregnation

Not permitted for external joinery softwood.

b. Double Vacuum Impregnation

Not permitted for timbers in contact with brickwork, blockwork, mortar, concrete, etc.

Pressure impregnation treatment and the preservative used shall comply with BS.4072 and shall be as specified in BS.5268 Part 5, Table 3 regarding salt retention. Following pressure impregnation, timber shall be allowed to dry back to a moisture content of 15 - 20% in accordance with BS.4072 Part 13.

Double vacuum treatment and the preservative shall comply with the British Wood Processing Association (BWPA) Specification 112 to 116. Timber shall be allowed to dry in covered open sided storage for forty-eight (48) hours following treatment. Rates for timber described as treated with preservative shall include for supply two (2) number brush coats of a preservative recommended by the timber treating company to all notches, holes, cut ends, etc.

Materials to comply with the following:- Hardwood BS.881; Softwood BS.589; Wood Screws BS.1210; Nails BS.1202; Ragbolts BS.1494; Timber Connectors BS.1579; Joinery Workmanship BS.1186; Glues BS.1444, 745, 1203, 407; Waterproof Building Paper BS.1521; Timber Moisture Content IS.96.

11.2 WOOD TREATMENT

Provide and apply two (2) full coat of an approved wood preservative to ALL existing exposed roof timbers. Apply as per manufacturer's instructions.

11.3 SLATE WORK

Fit in strict accordance with the manufacturer's instructions. Provide all slate work (cutting & double courses of slates) to eaves, verges (incl pointing with cement and sand), gables, valleys, etc.

Workmanship and slate specification shall comply with ICP 2:2002; BS.5534, 1997; BS.8000 Part 6.

11.4 LEAD WORKS

All lead shall comply with BS EN 12588 and shall be free from all defects, cracks, etc. and shall be uniform in thickness and texture.

a. Valley Works - if applicable

Shall be Code 7 (35.72 kg/m^2) lead. Shall be laid in lengths not greater than 2.40m. The lead is to be dressed to slope of boarding, turned over tilting fillet on either side and dressed under the slates. Laps shall be 100mm minimum. Each sheet to be close copper nailed at the upper end. The lower end of the valley is to be neatly dressed into the eaves gutter. The upper end is to be dressed under the ridge.

b. Lead Soakers

Code 5 (25.40 kg/m^2) lead soakers. Soakers shall have a girth of 300mm and shall be turned up 100mm at vertical face and be dressed down between slates.

c. Lead Stepped and Cover Flashings

Code 5 (25.40 kg/m^2) lead steeped and cover flashings. Shall be wedged into prepared grooves and pointed in cement mortar (1:3). Laps to be 100mm and all joints neatly welted. Girth 200mm.

Include for all lead soakers and lead stepped flashings at abutments. Lead to comply with above mentioned standards.

11.5 DISPOSAL

Include for the complete disposal of all materials and this work shall comply with the latest DOEHLG and Local Authority requirements and Regulations.

11.6 MATERIALS

Materials shall comply with the following specifications

Natural slates	- S 680: part 2
Clay tiles	- BS 402
Concrete tiles	- BS 473,550
Fibre cement slates	- BS 690: Part 4
Nails for slates and tiles -	- BS 1202: Part 2
for underlay	- BS 1202: Part 1
for battens	- BS 1202: Part 1
for fixing clips	- BS 1202: Part 3
Timber battens	- BS 5534: Part 1
Felt	- BS 747
Lead	- BS 1178
Aluminium for flashing	- BS 1470
Aluminium extrusion	- BS 1474
Copper	- BS 2870

11.7 WORKMANSHIP

Slating and tiling shall be executed in accordance with the instructions of the manufacturer of the product being used. Double width and width and a half slates and tiles shall be used where necessary. Workmanship shall comply with the following Codes of Practice.

Slating	- CP 142
Tiling	- CP 142
Aluminium sheeting	- CP 143, part 1 and 7
Lead sheeting	- CP 143, part 3
Copper sheeting	- CP 144, part 4
Felt roofing	- CP 144, part 1

11.8 LEAD FLASHING

Lead flashing shall be Code 5 milled lead. All lead will be immediately treated with two coats of patination oil.

11.9 TRIMMING

Where edge trims and the like are specified they shall be provided with matching end and angle pieces.

12. WOODWORK

12.1 MATERIALS

Materials shall comply with the following specification:

Hardwood	-	BS 881
Softwood	-	BS 589
Woodscrews	-	BS 1210
Nails,	-	BS 1202
Ragbolts, coach,screws, fixing accessories	-	BS 1494
Timber connectors	-	BS 1579
Plywood, Chipboard	-	BS 5669
Fibre boards	-	BS 1142
Blockboard	-	BS 3444
Decorative laminated plastic sheet	-	BS 3794
Joinery workmanship	-	BS 1186
Glues	-	BS 1203, 1204, 1444, 745, 407
Softwood dimensions	-	BS 4471
Hardwood dimensions	-	BS 5450
Timber moisture content	-	IS 96

12.2 TIMBER FOR CARPENTRY

Timber shall be sound, well-conditioned, properly seasoned to suit the particular use and free from defects or combination of defects rendering it unsuitable for its intended use. It shall be free from loose and unsound knots, clusters of knots, wane, pitch pockets, woodworm and decay.

Timber to receive a clear finish, whether used in the solid or as a veneer, shall be of class IS. Samples of the timber proposed for use shall be submitted to the Employer Representative for approval and all timber used shall an equivalent sample in quality, colour and grain pattern

The joinery shall be constructed exactly as shown on the Drawings .Only correct methods of jointing shall be used, such as housing, tanning etc. being carried out where appropriate All joints shall comply with B.S. 1186 Part 2. Take all reasonable measures to check or prevent capillary penetration of water in the joints and open connections of external joinery works and in all other positions where joinery works may be exposed to water. The arrangement, jointing and fixing of all joinery shall be such that shrinkage in any part in any direction shall not impair the strength and appearance of the finished work and shall not cause damage to contiguous materials or structures. Reasonable tolerances shall be provided at all connections between joinery works and building proper, so that any irregularities, settlements or other movements shall be adequately compensated. Ensure that all weathering surfaces, throating's, grooves, joints etc. and all open connections shall be properly executed and shall obtain a reasonable degree of weather resistance.

Should any of the joinery work shrink, warp, wind or fly more than 3mm before termination of the Defects Liability Period, the same shall be removed and new re-fixed in its place at the Contractor's expense together with any other work which may be thereby affected.

All joinery shall be in strict accordance with the detailed drawing. No stock mouldings etc. will be allowed in any position of the Works. Hardwoods shall be protected with polythene sheeting or other approved method against

all forms of staining, discoloration or any other damage during the course of the building operations. All hardwoods so affected shall be replaced at the Contractor's expense.

All timber used in unexposed carpentry, except where otherwise specified, shall be best quality white deal, thoroughly seasoned, free from large loose dead knots, shakes, sap or waned edges. It shall be given two coats of Protim or equivalent wood preservative.
All timber used in joinery is to be best quality, preserved by pressure vacuum treated by Messrs. Protim or equivalent, except where otherwise stated, and obtained from an approved merchant. Manufacturer of all joinery shall be put in hand, framed up and left for seasoning immediately after award of the contract, but shall not be stopped or primed until inspected by the Employer's Representative. Joinery shall be in strict accordance with the detailed drawings, and stock mouldings will not be allowed in any portion of the works. Any work which warps, splits, shrinks or opens during a period of 12 months after completion of the building shall be removed and replaced at the Contractor's expense.

Stress graded softwood shall be graded in accordance with BS 4978, comply with BS 5268, Part 2 and be as follows:

Location	Strength Class	Origin	Grade
Roof and ceiling members	SC 2	Home grown	SS
Studding and ground floor joists	SC 1	Home grown	SS

The strength grade shall be stamped on the timber.

The term 'home-grown' shall mean grown in Ireland or Britain and shall be equivalent to the term 'British Grown' where used in BS 5268, Part 2.The moisture content of all timbers shall conform to the limits set out in I.S. 96. The Contractor shall be responsible for ensuring that the moisture content of timber for joinery work is appropriate to the conditions in which the materials are to be employed.

12.3 SOFTWOOD FOR CARCASSING FIRST FIXINGS

Timber for structural use shall be strength C16 and to be stamped on the timber.

12.4 TIMBER BOARDING

Timber boarding shall be free from:-

1. Cupping in excess of 1mm for each 50mm of width.
2. Unsound knots exceeding 25mm in diameter or loose knots or knot holes exceeding 10mm diameter.
3. Wear on faces.
4. Fixtures on faces in excess of 1mm width or 300mm in length or greater in depth than half the thickness of the board.

12.5 PLYWOOD

Plywood shall comply with EN 13986 and IS EN 636.

Use as follows:-

Grade 1 veneer	where clear finish required.
Grade 2 veneer	where oil painting required.

Grade 3 veneer for concealed surfaces

Bonding type

MR.	for interior use
WBP.	for exterior use
INT.	not to be used.

Marine plywood shall comply with B.S. 1088.

12.6 FIBRE BUILDING BOARDS

Hardboard and soft board shall comply with B.S. 1142, Part 2 and 3.

12.7 NAILS

Nails shall comply with B.S. 1202. Nails for fixing joinery having one external exposed face shall be non-ferrous or sherardised steel nails. Hardened high tensile steel masonry nails shall be cadnium plated, gunfired grade.

12.8 WOOD SCREWS

Screws shall comply with B.S. 1210. Screws for fixing joinery having an external exposed face shall be solid brass.

12.9 BOLTS, ETC.

Bolts, expanding bolts, rag bolts, coach screws and other fixing accessories shall comply with B.S. 1494.

12.10 CONNECTORS, ETC.

Shear plate connectors, toothed connectors shall comply with B.S. 1579. Framing anchors, joist hangers etc. shall be hot dip galvanised of a type to be approved by the Employers Representative.

12.11 ADHESIVES

Adhesives for:-

a. Exterior use shall be synthetic resin type complying with B.S. 1204 Part 1 - type WBP

b. Interior use shall be synthetic resin type complying with B.S. 1204 Part 1 - type MR.

12.12 SEALANTS

Mastic shall be non-setting butyl mastic to the approval of the ER.
Two part polysulphide sealing compound shall comply with B.S. 4254 and be grey in colour.

12.13 PRESERVATIVE

All timber described as being treated with preservative shall be treated by one of the following methods:
Pressure impregnation -not permitted for external joinery softwood. Double vacuum impregnation - not permitted for fillets in concrete or ground cills in contact with brickwork, blockwork, mortar etc. at or below DPC level.

Pressure impregnation treatment and the preservative used shall comply with BS 4072 and shall be to the appropriate average dry salt retention specified in BS 5268: part 5 table 3. After pressure impregnation timber shall be dried back to moisture content of 15-20% in accordance with BS 4072 (para 13).

Double vacuum treatment and the preservative used shall comply with the British Wood Preserving Associations (BWPA) specifications 112 to 116 appropriate for the company treating the timber. Timber shall be allowed to dry in open storage for 48 hours following treatment. Prices for timber described as treated with preservative shall include for applying two brush coats of a preservative recommended by the timber treating company to all notches, holes, cut ends or surfaces machined after treatment.

12.14 TOLERANCES FOR STRUCTURAL TIMBERS

All structural members should be checked to comply with allowable tolerances. The permissible dimensional deviations for timber work generally shall be as follows.
Level: for any nominally horizontal surface when measured from the nearest reference level: plus or minus 10mm.
Position on plan: for the position of any nominally vertical face, at the lower edge, when measured horizontally from the nearest reference line: plus or minus 10mm.

Plumbness: for plumb of upper to lower edges of any nominally vertical surface plus or minus 2mm in any 1m but not more than 10mm.

The permissible dimensional deviation from the basic cross-sectional sizes of sawn softwood timber, measured at 20% moisture content, shall be those specified in CP112; Part 2. The permissible dimensional reductions from the basic sawn size by planning of two opposed faces of constructional timber shall be as follows:-
Thicknesses and widths not exceeding 100mm; 3mm.
Thicknesses and widths exceeding 150mm; 6mm.

The permissible deviation in the level of the finished surface of any floor at any point under a 3m straight edge placed level in any direction shall be 5mm. Distortion in timber due to bow, spring, twist and cup shall not exceed the limits recommended in B.S. 4978.

12.15 TOLERANCES FOR SECOND FIXINGS, COMPONENTS

The permissible dimensional reductions from the basic sawn size to the finished size of timber used in second fixings, components shall be 3mm for each wrought face.

12.16 STORAGE OF MATERIALS

All materials shall be stored under cover in dry well ventilated storage and stacked to allow free circulation of air around each item. Joinery shall not be fixed before the building has dried out to a suitable level which can be maintained.

12.17 WORKMANSHIP

Workmanship shall comply with the following Standards and Codes of Practice Joinery - BS 1186
All carpentry shall be executed in a workmanlike manner with all joints, fixings and methods of working chosen being the most appropriate for the work. All framed joints in joinery shall be mortice and tenon type as defined in BS 1186. Other joints shall be as shown on the drawings or as appropriate for their location and function. Any timber showing damage or signs of distress after fixing or jointing shall be removed and replaced.

Where screwed connections or joints are to be made the price shall include for pre-drilling a hole in the timber appropriate to the size of the screw being used. Arises in joinery work should be rounded to a 1. 5mm radius.

Where pelleting of fixings is required the pellets shall be of the same material as the joinery being fixed, shall match the colour and grain and be finished flush

12.18 FITTING OF FIRE DOORS

Do not install internal components which are not required to be built-in as the work proceeds until the air conditions in the building have an equilibrium moisture content corresponding approximately with those which will prevail during normal occupation or service. Where timber frames are not impregnated with preservative and are to be fixed in concrete or masonry walls, apply one coat of brush applied preservative to backs and other bedding surfaces before priming or sealing.

Avoid distortion of timber frames when fixing in prepared openings. Pack around perimeter with hardwood wedges to give an equal clearance gap between frame and opening and at all locations where fixings may distort the frame. Fix cramps to back of frames with two 10 gauge rust resistant screws.
Locate door frame fixings adjacent to hinging points. Provide four fixings to each jamb unless otherwise shown. Fix heads of frames over 1200mm wide with at least one fixing at centre. Ensure that gaps between structure and frames for fire resistant doors do not exceed 13mm and are filled with non-combustible materials.

12.19 FIXING OF IRONMONGERY

The tender sum shall be deemed to include for the fixing of all ironmongery in accordance with drawings and Ironmongery schedules. All locks, hinges and fastenings shall be fixed with screws, with proper counter-sinking for same. Matching screws shall be used for all hinges, fastenings and fittings.

All ironmongery is to be carefully wrapped and protected until completion of the works. Any ironmongery defaced or damaged prior to handover, will have to be replaced at the Contractor's expense as directed by the Employers Representative. All locks etc. are to be properly labelled and delivered up in accordance with the Employers Representative's instructions.

12.20 STORING MANUFACTURED COMPONENTS

Do not deliver to site any components which cannot be immediately unloaded into suitable conditions of storage. Unload, handle and store components in accordance with manufacturer's recommendations.

Store components in conditions suitable for specified moisture content, avoid prolonged exposure to direct sunlight and ensure good ventilation. Stack components on bearers on level dry floors under cover. When stacking stagger components or separate with spacers to prevent damage by and to projecting ironmongery, beads, etc.

Stack doors horizontally on not less than three level bearers at not more than 1m centres. Protection; avoid distortion of components during transit handling and storage. Retain protective coverings in position for as long as practicable, but remove on completion. Prevent damage to arises and glazing beads.

12.21 PRESERVATIVE TREATMENTS

Preservative treatment of timber shall comply with B.S. 5268 : Part 5 for the proposed use and durability of the timber. Treatment type: copper chrome arsenic vacuum pressure treatment or alternative solvent double vacuum treatment. Timbers treated with a water borne solution shall be dried down again to required moisture content before installation.

The moisture content of timber at time of fabrication and installation shall comply with I.S. 96. Before fabrication or installation, re-dry to the specified moisture content, timber which has been impregnated with copper/chrome/arsenic, by vacuum pressure treatment.
Provide a certificate from the processor with each consignment of the timber stating:

1. The preservation treatment carried out.
2. The moisture content of the timber prior to treatment.

Before treatment, carry out all sawing and planning to give the finished cross sections and, unless otherwise approved, all cross cutting, drilling or other machining.

Where manual treatment is to be carried out, brush preservative onto clean dry timber in flood coats with a soft bristle brush. Apply second and any subsequent coats after previous coat has soaked in, but before it has dried. Treatment shall extend a minimum of 300mm from ends in contract with concrete or masonry, unless otherwise indicated.

Liberally brush pre-treated timber with two coats of a compatible preservative supplied by the manufacturer or processor on any fresh surfaces exposed by drilling or cross cutting after treatment. Treated timber subsequently rip-saw and timber for use in ground contact which has been drilled or cut, shall be retreated by the specified process. Do not apply any metal fittings to timber treated with copper/chrome/arsenic within seven days of treatment.

12.22 STRUCTURAL TIMBER WORK

Joints in structural timber work generally shall be checked by the Contractor so as to shall comply with C.P. 112: Part 2. Where defective timbers are found the contractor should install timber members in continuous lengths without splices where possible unless otherwise shown or approved. Ensure full contact of surfaces over the area of joints and over the area of other bearing surfaces. Make notches in structural timbers only in approved locations and to approved methods and dimensions. Drill holes where required in joists, centred at half the depth only and with diameter limited to one-third of the joist depth, and a minimum distance of 150mm from edge of hole to end of joist, unless otherwise indicated.

Unless otherwise indicated the length of nails used shall be not less than twice, the screws not less than 1.5 times, the thickness of the members through which they are driven, but they shall not be longer than the combined thickness of the sections being jointed less 5mm. Do not insert nails or screws in any end split. Where nailing may cause splitting, pre-bore holes. Drill pilot holes for non-ferrous nails in hardwood. Bore lead holes for all screws. Drill holes for bolts as close as possible to nominal diameter of bolt but do not exceed 1.6mm larger than bolt diameter. Do not insert bolts in any end splits. Install washers under head and nut of all bolts bearing on timber, except under heads of coach bolts. Tighten nuts as far as possible without crushing surface of timber. Select and arrange individual pieces of timber so that knots and other permitted defects will not interfere with proper jointing or fixing, or otherwise reduce the strength of assemblies.

12.23 BOARDING

Where boarding is specified to be fixed or replaced ensure a close and tight fit along full length of boards and adjoining ends. Stagger end joints so they are not less than two board widths apart in all directions. Locate joints over centre of supports, unless boards are end matched. Fix boards at right angles, to supports, unless otherwise indicated. Remove any lipping at edges and provide a smooth surface.

For exterior cladding, lay and fix boards together under pressure, or otherwise, as directed. The length of nails for boarding shall be not less than 2.5 times the board thickness, but not longer than the combined thickness of the

sections being jointed, less 3mm. The length of screws for boarding shall be not less than twice the board thickness, but not longer than the combined thickness of the sections being jointed, less 3mm.

Nail or screw boards of each support as follows, with nails punched below the face of screws countersunk flush with the face of boards. Where floor boards are to be replaced ensure that the following details apply:-

T and G boards:	Up to 100mm wide - 1 nail or screw over 100 wide - 2 nails or screws
Plain edged boards:	Up to 175mm wide - 2 nails or screws over 175mm wide - 3 nails or screws.

Secret nail boards at each support with one nail angle driven from above tongue.

12.24 SECOND FIXING AND TRIMS

Install trims where possible in unjointed lengths between angles or in straight runs. Mitre exposed angle joints unless otherwise indicated. Scribe timber sections to adjoining uneven surfaces unless other treatment is approved. Punch nail heads below surfaces of timber sections to be pointed or requiring a smooth surface. Countersink screw heads not less than 2 mm below surfaces of timber sections in trim work to allow for stopping. Countersink screw heads or bolts not less than 5mm below timber surfaces which are to be clear finished. Cut pellets from similar grained matching timber and glue in place with grain aligned. Finish flush with surfaces. Hardwood glazing beads shall be held with brass screws located not more than 50mm from each corner and spaced not more than 225mm apart intermediately. Screw fixing points shall be fitted with caps.

12.25 ASSEMBLING SECOND FIXINGS, COMPONENTS

The quality of workmanship in joinery shall comply with B.S. 1186, Part 2 for requirements as to fit, precision of joints and the use of adhesives, unless otherwise indicated. Construct joinery as shown on the drawings unless otherwise approved. Where details of joints are not shown, obtain approval of proposed construction details before starting fabrication.

Slightly round sharp arrises on exposed and semi-concealed surfaces. Sand and produce a smooth surface of joinery requiring a clear finish. Use approved filler to overcome the coarse grain or uneven suction conditions where growth rings are coarse and where there is uneven suction. Coat all knots and stop nail and other holes to match adjacent wood. Joinery detailed to be oil painted is to have a surface such that if it is properly painted in gloss paint no imperfections will be apparent.

Apply adhesive in accordance with the manufacturer's written instructions, and within any stated shelf life. Maintain mating surfaces in intimate contact to ensure adhesion within the setting time. Where work is not to be painted, prevent discolouration of exposed surface due to staining by adhesives. Use dowels of hardwood other than beech, grooved for adhesive and sized for a driving fit.

12.26 CLEARANCES IN SECOND FIXINGS AND COMPONENTS

Where hinged joinery items, other than full size doors, are fitted flush between straight or rebated frames, leave a gap at all points of not less than 1.5mm and not more than 2.5mm for work intended to be painted or to receive a thick coated finish and not more than 1mm for work to be finished otherwise.

Where the edges of hinged joinery items, other than full size doors, are rebated to overlap the frame, leave a gap between the lip and frame of not less than 1.5mm and not more than 2.5mm for work intended to be painted or to receive a thick coated finish and not more than 1mm for work to be finished otherwise.

Fit drawers in openings so as to slide freely without undue play vertically or horizontally. Where drawer front is rebated over edges of opening ensure that face of rebate is not more than 1mm from face of framing at any point. Where drawer front is fitted into an opening the drawer front size shall be less than the opening size by not more than 1.5mm in width or height. Fit such drawers with accurately secured stops.

12.27 FIXING

Units shall be fixed into the ope reveals with a minimum of 15mm overlap to external reveals and shall be pointed around their perimeter, internally and externally, with a gun applied elastomeric silicon based sealant of selected colour. Fixings shall be at centres not greater than 400mm and shall not be closer than 200mm to the corners of units. Fixings shall be of corrosion resistant material and shall comply with BS 4873. Upstands to existing cills where necessary shall consist of sand/cement mortar (1:1:5) to provide seating for new windows. All surfaces shall be cleaned before the application of sealant in accordance with the sealant manufacturer's instructions.

12.28 PRESERVATIVE & WOODWORM TREATMENT

All softwood timber shall be vacuum pressure treated with preservative to comply with I.S. 131. Any fresh surface exposed by drilling or crosscutting after treatment shall be treated with an approved preservative in an approved manner.

Vacuum treatment and the preservative used shall comply with the British Wood Preserving Associations (BWPA) specifications 112 to 116 appropriate for the company treating the timber. Timber shall be allowed to dry in open storage for 48 hours following treatment. Prices for timber described as treated with preservative shall include for applying two brush coats of a preservative recommended by the timber treating company to all notches, holes, cut ends or surfaces machined after treatment.

12.29 STORAGE OF MATERIALS

All materials shall be stored under cover in dry well ventilated storage and stacked to allow free circulation of air around each item. Joinery shall not be fixed before the building has dried out to a suitable level which can be maintained.

12.30 MASTICS

The mastics used shall be a polysulphide mastic complying with B.S. 5215. A sample of the proposed mastic shall be submitted to the Employers Representative for his approval. Adhesives used in the joinery works are to comply with B.S. 1204. All glues to comply with BS EN ISO 9665m.

12.31 MEASUREMENT AND INSPECTION OF WORK

Measure each ope prior to the manufacture of the joinery and shall be responsible for ensuring that the joinery work is the correct size. All joinery work will be inspected by the Employers Representative and approved prior to being wedged up.

12.32 MOISTURE CONTENT

The moisture content of the timber when the joinery is manufactured and delivered on site shall come within the limits given in I.S. 96.

13. METALWORK

13.1 MATERIALS

Materials shall comply with the following specifications

Hot rolled steel sections, plates, bars and rivets	-	BS 4, 449, 4360, 4848
Mild steel	-	BS 4360
Steel tubes	-	BS 1775, 4848
Steel bolts, nuts and fixing accessories	-	BS 4190, 4933,1494, 4620, 3692,4395,4320
Cast iron	-	BS 1452
Galvanizing	-	BS 729
Stainless steel plate and strip		
- internal	-	BS 1449, part 2 type 302S25
- external	-	BS 1449, part 2 type 316S16
Aluminium		
- sheet and strip	-	BS 1470
- drawn tube	-	BS 1471
- bars and extruded round sections	-	BS 1474
- anodised wrought aluminium	-	BS 3987

13.2 ACCESSORIES

Bolts, Nuts & Screws: ISO 888, grade 8.8 and manufactured by a BSI registered firm.
Washers: to BS 4320. Expanding Bolts and Nuts: to BS 4190 Grade 8.8 but purpose made with either normal bolt head or screwed both ends with two extra nuts and manufactured by a BSI Registered Firm.

13.3 WORKMANSHIP

13.3.1 FABRICATION

Generally: Fabrication in workshop to BS 5950: Part 2.Prevent metallic contact of dissimilar metals, likely to cause bimetallic corrosion, by insulation at contact points. Preparation for Protective Coating Application: prepare steelwork at pre and post fabrication stages for application of offsite protective coating.

13.3.2 HOLING:

Form holes to BS 5950 Part 2. Remove all burrs from holes. Filling of incorrect holing is not permitted. Members with incorrect holing will be rejected by the Employers Representative. Drill holes for bolts.

13.3.3 WELDING

Comply with BS 5135 and execute in the fabrication workshop unless otherwise instructed.

13.3.4 ERECTION

BRITISH STANDARD: comply with BS EN 1090-2, unless otherwise instructed.

13.3.5 BALUSTRADES

Ensure that the fixing of balustrades, handrails, etc. is adequate for the loading to which they will be subjected.

14. GLAZING

14.1 MATERIALS

Materials shall comply with the following specifications

Hermetically sealed units	- BS 5713
Glass	- BS 952
Linseed oil putty for glazing wood	- IS 28
Two-part polysulphide sealants	- BS 4254
Safety Glass in Buildings	- BS 6206

Workmanship shall comply with the following Codes of Practice

Glazing generally	- BS 6262
Patent glazing	- BS 5516

Laminated and safety glass shall be ordered from the supplier pre-cut to size. Glass surfaces shall be kept dry during transit and storage. Glass becoming moist from condensation or other causes shall be thoroughly dried and aired. All glazing rebates and beads shall be primed and shall be kept free of dust and dry until glazing is complete.

Setting blocks shall be hammered lead, rigid nylon or sealed hardwood. Location blocks and distance pieces shall be of plasticised PVC corresponding to softness number 35-40 of BS 2571. Setting and location blocks shall be used in panes of ordinary glazing exceeding 0.2m2 and with all sizes of laminated glass, toughened glass and factory made double glazing units. Distance pieces shall be provided to all panes where a non-setting compound is used and they shall not be located coincident with setting and location blocks. In ordinary glazing the positions and sizes shall be as recommended in the appendix to BSCP 152. In laminated and toughened glazing or with factory made double glazing units the positions and sizes shall be as recommended by the glass or unit manufacturer.

All glazing compounds and tapes shall be used strictly in accordance with the manufacturer's recommendations. Glazing in linseed oil or metal casement putty shall be executed with proper bed and back putties, sprigs, clips and splayed and mitred front putties. The back putties shall be trimmed off flush with the tops of the rebates and the splayed front putties shall be finished 3mm back from sight line to allow for sealing between glass and putty with paint.

In bead glazing with a non-setting compound there shall be a minimum 3mm bed both sides of and around the glass. Mastic sealing strips shall pass around both sides of the glass, shall be mitred at corners and trimmed off flush with the bead and rebates. The strip shall be kept under compression by the beads and shall be at least 3mm thick under compression. Self-adhesive glazing tape shall pass round both sides of the glass, be mitred at the corners and trimmed off flush with the bead and rebate. Beads shall be fixed so as to prevent flexing or movement.

The wire in wired glass shall extend to the edges and be free of rust and the glass shall be fixed so that the wires are parallel to the framing. Adjacent wired panes shall be fixed so that wires present an appearance of continuity in both the horizontal and vertical planes. All glass shall be kept clean of paint, plaster etc. during the course of the Works and the price shall be deemed to include for cleaning all glass, both inside and out, to the Employers Representative's approval prior to handover to the Employer.

14.2 FLEXIBLE GLAZING COMPOUNDS

Plastic glazing compound shall comply with the written recommendations of the Glass and Glazing Federation (London).

14.3 SEALANTS

One part sealant, curing type shall comply with the written recommendations of the Glass and Glazing Federation (London).

14.4 PREFORMED COMPRESSION GASKETS

Non-structural gaskets shall comply with the specification of the Glass and Glazing Federation (London).

14.5 WORKMANSHIP

14.6.1 GLAZING AND FIXING

Glazing and fixing of glass generally shall be in accordance with the B.S. Code of Practice C.P. 152 and the written recommendations of the Glass and Glazing Federation (London). Glazing and fixing of sealed double glazing units shall also be in accordance with the written instructions of the manufacturers.

Installation of single and double glazed aluminium windows and doors shall be carried out in strict accordance with the manufacturer's instructions.

Glass and glazing units delivered to the site shall be unpacked and if wet, shall be dried. They shall be stored on edge on racks in dry conditions. Supporting blocks of wood or felt shall be used to prevent edge damage. In the case of double glazing units the blocks shall be set to form a right ample with the back support so that both panes are supported.

14.6 PREPARATION OF SURROUNDS

Prepare all frames for glazing. Any damage in transit or fixing must be rectified, so as to provide frames which are square, without distortion and with rebates free from obstruction. Rebates in hardwood doors shall be treated with two coats of sealer. Before glazing is commenced all rebates shall be dry and free from dust.

15. FLOOR WALL AND CEILING FINISHES

15.1 MATERIALS

Materials shall comply with the following specifications

Nails	IS 105 and BS 1202
Metal lathing	BS 1369
Gypsum plaster lath	IS 41 and BS 1230
Cement	IS EN 197.
Lime	IS 8
Gypsum plaster	IS En 13279-2 and IS EN 13279-1
Sand - gypsum plaster mix	BS 1198, table 1 type 1
- cement and lime mix	BS 1199, table 1
Ready mixed lime and sand	BS 4721
Plasticiser	BS 4887
Sand for screeds	BS 882 table 2, zone 2
Ceramic wall tile	BS 1281 & BS 6431
Clay tiles	BS 1286
Concrete tiles	BS 1197
Vinyl tiles	BS 3261
Wood block flooring	BS 1187
Plasterboard	BS 1230

16.2 WORKMANSHIP

Workmanship shall comply with the following codes of practice

Internal plastering	- BS 8481 (2006)
External rendering	- BSCP 221
Wall tiling	- BSCP 212
Tile and slab flooring	- BSCP 202
Sheet and tile flooring	- BSCP 203
In-situ floor finishes	- BSCP 204
Wood block flooring	- BSCP 201

Surfaces to receive plaster or render shall be thoroughly prepared as appropriate to the finish. The preparation of surfaces and the application of gypsum based plasters shall be strictly in accordance with the recommendations of Gypsum Industries Ltd.

Brickwork, blockwork or concrete to receive cement based plaster shall be thoroughly dusted off and cleaned. Brick or block surfaces shall be raked out to provide a key if the key is inadequate. Concrete shall be free of mould release oil. The surface of the concrete shall receive either a coat of bonding agent or shall be mechanically hacked. High suction backgrounds shall be wetted. The Contract Sum shall be deemed to include for this preliminary work.

Plasterwork generally shall comply with CP211. Cement shall be Irish manufactured Portland cement complying with I.S. No.1 lime shall be hydrated lime of approved manufacture and comply with I.S.8.1949. Sand shall be clean sharp evenly graded with B.S. 1198 and B.S.119. Water shall be fresh and free from harmful matter. Building paper shall be waterproof as B.S.1521 Class B.

Gyplite plasters supplied by Gypsum Industries Ltd. or equivalent, shall be used in strict accordance with the manufacturer's instructions and comply with I.S.27 2.7.1 Workmanship
Do not commence internal plastering until it is protected at all times from the weather. Premature or localised drying of coatings shall be avoided. No plastering shall be done while the air shade temperature is below 5oC on a falling thermometer and the temperature shall be kept above 4°C for at least 24 hours after setting.

Plastering shall be protected from frost, continued dampness or extreme drying conditions. Materials shall be measured and mixed in clean containers and these shall be cleaned after each use. All tools shall be kept clean and fresh plaster shall not be mixed with old or set plaster. Cement-lime-sand plasters shall be used within two hours of gauging with cement. Gypsum and lightweight plaster shall be used within one hour of adding water. Plasters shall not be re-tempered with water.

Cement-lime-sand plasters shall be allowed to dry out thoroughly before a further coat is applied. Further coats may be applied to gypsum or lightweight plasters as soon as the undercoat has set and developed reasonable suction. On metal lathing the first coat shall be allowed to set sufficiently to prevent breaking the key when the second coat is applied.

All undercoats shall be scratched thoroughly to provide a key for subsequent coats. Unless stated to the contrary all finishing coats in cement-lime-sand plasters shall be finished with a wood trowel and gypsum or lightweight plasters with a steel trowel.

Fair joints, edges, internal and external angles shall be provided at all occurrences. Temporary rules, temporary screeds and templates shall be provided wherever necessary. Finishes shall be worked into beads, dividing strips and the like. Arises on all in-situ finishes shall be pencil rounded. All joints on plaster boards shall be jointed with reinforcing tape. Fair intersections shall be provided on all work specified as being laid to cross falls.

16.3 STORAGE

Hydrated lime, gypsum plaster and cement shall be stored separately from each other in dry ventilated conditions on a raised floor or in suitable silos. Ready mixed sand-lime shall be stored on a clean impermeable surface under weatherproof conditions and the storage period shall be kept as short as possible. Different aggregates shall be stored separately on hard self-draining areas or in suitable hoppers.

16.4 THICKNESS OF RENDER AND PLASTER COATS

The following thicknesses shall be applied unless otherwise specified

External Work	**Thickness**
Scudding coat	Minimal
Undercoat render	12mm
Finish coat render	8mm
Internal Work	
Scudding coat	Minimal
Undercoat - render	8mm
Finish coat - render	5mm
Gypsum undercoat to concrete blockwork	11.1mm of Gyplite undercoat
Gypsum undercoat to concrete	7.9mm of masonry
Gypsum undercoats	1.5mm of Gyplite "finish"plaster.
Gypsum board finish to plasterboard	Single coat board (one coat work) 3mmb of Pinnacle finish
Gypsum hard wall finish to render	1.6mm of Pinnacle plaster
Gypsum finish to plasterboard ceilings	3mm of Pinnacle Board finish

The permitted deviation under a 2m straight edge from the flatness of the finished plaster surface at any point shall not be more than 3mm.

16.5 PLASTERBOARD COVERINGS

Plasterboard coverings shall be either lath or wallboard as manufactured by Gypsum Industries Ltd. or equivalent of the thickness, type and edge profile described. They shall be fixed and finished in strict accordance with the manufacturer's instructions.

16.6 DAY JOINTS/ PROTECTION OF WORKS

Day joints shall not be permitted in the plastering. Plastering shall be protected from the frost, extreme drying conditions and continued dampness.

16.7 MISCELLANEOUS MATERIALS

Variations to the materials shown on the drawings (or listed below), may be approved subject to the Contractor submitting full details of his proposals in writing.

16.8 FLOOR FINISHES

Generally workmanship shall confirm to B.S.C.P. 201 and B.S.C.P 203. Laying is to be carried out by an approved firm. Operatives must be skilled in laying the materials specified.

16.9 CONDITIONS

Do not lay materials before building is weather tight, wet trades have finished their work, the building is well dried out and all paint work is finished and dry. Before during and after laying, maintain temperature and humidity at levels approximating to those which will prevail after building is occupied.

Do not lay if air temperature is less than minimum recommended by the manufacturers of materials. Do not lay if moisture content of floor is above the max recommended by the manufacturers of materials.

16.10 MOISTURE

Where materials are to be struck to new wet laid substrates.

1. Turn off drying aids for not less than 4 days.
2. Test for moisture content using a hygrometer as in CP 203, Part 2 and BRE digest 16.
3. Take readings in all corners, align edges and at various points over the area being tested.
4. Do not lay until all readings show 75% RH or less.

16.11 ACCLIMATISATION

Store plastic sheets and tiles in air temperature of 18C or more for at least 24 hours immediately beforehand.

16.12 ADHESIVE

Use in accordance with manufacturers recommendations. Remove surplus adhesive from face of materials being laid and any other surface, as the work proceeds

16.13 FLOOR SCREEDS

Surfaces to receive screeds shall be cleaned off and free of debris and dust. For screeds less than 50mm thick the concrete surface shall be mechanically hacked to expose the aggregate, washed and brushed clean. Not less than 12 hours later any surplus water shall be removed and a cement and water grout brushed onto the surface just ahead of the application of the screed.

Where screeds are greater than 50mm thick it is not necessary to expose the aggregate but the same cleaning and grouting procedure should be followed. Where an un-bonded construction is required the screed shall be laid on an isolating membrane.

Screeds to receive thin sheet or tile finishes shall generally be laid in room sized bays. The position of day joints, if required, shall be to the Employers Representative's approval. Screeds to receive in-situ tile, slab or block finishings or heating elements shall be laid in square bays not exceeding 15 square metres. At least 24 hours shall elapse between the laying of adjacent bays and bays should be laid to break joint.

16.14 RENDER

Plastering shall be protected from frost, continued dampness or extreme drying conditions. Materials shall be measured and mixed in clean containers and these shall be cleaned after each use. All tools shall be kept clean and fresh plaster shall not be mixed with old or set plaster. Cement-lime-sand plasters shall be used within two hours of gauging with cement. Gypsum and lightweight plaster shall be used within one hour of adding water. Plasters shall NOT be re-tempered with water.

Cement-lime-sand plasters shall be allowed to dry out thoroughly before a further coat is applied. Further coats may be applied to gypsum or lightweight plasters as soon as the undercoat has set and developed reasonable suction. On metal lathing the first coat shall be allowed to set sufficiently to prevent breaking the key when the second coat is applied.

All undercoats shall be scratched thoroughly to provide a key for subsequent coats. Unless stated to the contrary all finishing coats in cement-lime-sand plasters shall be finished with a wood trowel and gypsum or lightweight plasters with a steel trowel. Arises shall be pencil rounded.

16.15 PLASTER STOPS

Use Catnic Galvanised Steel Plaster Stop Beads and Angle Beads to BS 2989 and BS 6452 or equivalent. Bead size to depend on plaster thickness. Apply Beads to all wall-to-wall, and ceiling-to-wall junctions.

16.16 DIMENSIONS

Do not start work until socket outlets, duct covers and other fixtures round which materials will have to be cut have been fixed.

16.17 SETTING OUT

Lay tiles or sheets with joints parallel to room axes. All sheets are to be laid out so as to give wide enough margins at walls, and are to be scribed to walls and other edges. No patching will be allowed. Joints are to be overlapped by 12mm and cut in, not butted. The seams are to be welded using hot welding rods in colours to be selected by the Employers Representative to match or contrast. PVC sheeting is to be manufactured by approved firms. Remove all scrap and clean surfaces in accordance with their manufacturer's recommendations.

16.18 FLOOR TILING

Set tiles on proprietary thin bed adhesive. Joints to be even and not more than 3mm wide. Grout up with cement sand (1:1) worked well into joints when bed is sufficiently firm to prevent disturbance of the tiles. Clean off surplus grout from face of tiles. Allow no traffic on the floor until 4 days after completion and then only light traffic for a further 10 days. Generally remove all scrap and clean surplus in accordance with manufacturers' instructions.

17. PAINTING AND DECORATING

17.1 MATERIALS

Materials shall comply with the following specifications:

White spirit	- IS 11
Knotting	- IS 16
Gold size	- IS 17
Oil paints	- IS 15,32,115
Priming paints	- IS 18,33,110
Varnishes	- IS 10,103,104
Emulsion paint	- IS 129
Linseed oil	- IS 14,93,94
Turpentine	- IS 12
Wallpaper	- IS 55,56
Surface preparation of steel for painting	
Swedish Standard	SIS 05 5900.

Obtain approval from the Employer's Representative for the brands of paint he wishes to use. All paints, varnishes, distempers and other surface coatings shall be delivered in sound and sealed containers, clearly labelled by the manufacturer to show the type of product, its brand name, the use for which it is intended and the manufacturer's

batch number. Labels shall be printed. Hand or type written labels will not be accepted. No paints other than water based paints and bituminous paint shall be delivered in containers exceeding 5 litres capacity.

Materials for the works may be obtained from different manufacturers but undercoats and finishing coats to be used together must be obtained from the same manufacturer. Materials shall be kept in a clean, dry and well ventilated store and be protected from frost. Paint shall not be thinned or reduced in any way except where specified by the manufacturer. Thinners shall not be added in excess of 5% by volume unless specified by the manufacturers.

17.2 WORKMANSHIP

Workmanship shall comply with the following Code of Practice:

Painting of buildings - BSCP 231

Painting work shall not be carried out when:

(1) air shade temperature is less than 5 degrees Centigrade
(2) relative humidity is such that condensation is present, or may be expected, on the surfaces or when there is a possibility that it will affect the application and or drying of the coating
(3) the moisture content of the surface to be painted exceeds 19%, or the level specified by the paint manufacturer if lower, when measured with an electronic meter.
(4) heat is liable to cause blistering or other defects

All brushes, tools and equi shall be kept in a clean condition and surfaces shall be clean and free from dust or contaminants such as oil during painting. No painting shall be carried out in the vicinity of operations generating dust. Provide a mobile receptacle into which all liquids such as brush cleaning fluid, slops from tins etc. are to be placed. Under no circumstances must brushes be cleaned or painting materials disposed of into gullies, manholes, sinks, lavatories, wc's or any other sanitary fittings. Refuse and flammable residues must be safely removed from site.

17.3 APPLICATION AND FILM THICKNESS

Paints shall be applied at the coverage rates specified by the manufacturer for the particular application. Dry film thickness shall correspond to that specified by the manufacturer. The average of the dry film thicknesses taken over any square metre of surface shall equal or exceed the specified nominal thickness and in no case shall any reading be less than 75% of the specified nominal thickness.

17.4 PREPARATION AND PAINTING GENERAL

Each coat of paint applied shall be tinted so that it can be clearly differentiated from its substrate. This shading shall not be allowed to affect the final colour.

Surfaces shall be prepared in accordance with the recommendations issued by the manufacturer of the paint to be used on the surface. Any materials used in preparing surfaces shall be compatible with the paint to be used, i.e. stopping and fillers. Stopping for clear finished surfaces shall be of a colour to match the finished colour of the adjoining surfaces.

Paint shall not be thinned or reduced in any way except where specified by the manufacturer. Thinners shall not be added in excess of 5% by volume unless specified by the manufacturer. All surface fixed ironmongery (except hinges) on doors and windows and similar fittings shall be removed prior to the commencement of painting and shall be re-fixed on completion. The tender shall be deemed to include for removing and re-fixing the ironmongery

and fittings. Any items which it is not possible to remove shall be protected to ensure they are not marked with paint and the Contractor shall ensure that the function of any moving parts of components or hardware is not impaired by paint.

Unless otherwise specified the following surfaces shall not be painted:

- Acoustical tiles and plaster
- Naturally finished metalwork such as bronze, brass, anodised aluminium, stainless steel etc.
- Self finished equi or fittings such as Formica veneered worktops
- Ceramic and glazed surface
- Floor coverings
- Valves, sprinkler heads, fusibles links, thermostats etc.

Items not to be painted shall be carefully masked or otherwise protected during the course of the work and the tender shall be deemed to include for protecting and removing the protection. Each coat of paint must be allowed to dry and be rubbed down with a fine abrasive paper and dusted off before the subsequent coat is applied.

Roller application of paint will not be permitted except for the application of emulsion paint to internal walls and ceilings. Brushes shall be used for cutting in on these areas. Rollers shall be either foamed plastic or short pile sheepskin.

17.5 MOSIURE CONTENT

No paint or decoration shall be applied until the surface and its substrate have dried out to a moisture level acceptable to the manufacturers of the specific products being used.

17.6 SURFACES PREPARATION

Surfaces shall be prepared in accordance with the recommendations issued by the manufacturers of the paint to be used on the surface. Any materials used in preparing surfaces shall be compatible with the paint to be used, i.e. stopping and fillers. Stopping for clear finished surfaces shall be of a colour to match the finished colour of the adjoining surfaces.

Preparatory work listed below shall be deemed to be included in rates for painting. The carrying out of this preparatory work shall not release the Contractor from his obligations to provide a satisfactory painted finish should the paint system applied fail in any way. All wood is to be sanded down smooth prior to the application of any paint, stain or clear finish.

17.7 SOFTWOOD

Apply two coats of knotting to small knots (large knots should already have been cut out), prime with aluminium wood primer and apply extra coat to end grain, stop nail holes or cavities, sand down stopping flush with adjoining surface and prime over stopping, apply filler to grain or surface depressions. If wood is to have a clear or stained finish then the knotting will not be necessary as 'selected' timber will have been used and the stopping shall be chosen to match the colour of the coated wood. The wood shall be primed if the paint manufacturer recommends that a primer be used under his product.

17.8 PREPRIMED SOFTWOOD

Primer should be touched up if damaged and any areas showing signs of chalking, flaking or cracking should be sanded off and re-primed. Thereafter timber should be stopped and filled as for softwood.

17.9 HARDWOOD

Hardwood to be painted shall be primed with a primer suitable for the type of hardwood. Hardwood to receive a clear or stained finish shall be stopped with a material matching the colour of the coated wood and should be primed if the manufacturer of the paint recommends the use of one.

17.10 STEEL

Pre-primed steel shall have any damage to the primer touched up .

17.11 PREVIOUSLY PAINTED MATERIAL

All loose material shall be removed back to a firm edge. The edge shall be feathered with sandpaper and defects made good with primer, stopping, filling and undercoat to bring up stripped areas level with adjoining surfaces. Surfaces shall then be rubbed down with abrasive paper, washed and allowed to dry.

Clear finished work shall be sanded and washed down and any loose material removed. The timber left bare shall be built up to the level of the adjoining surfaces with as many coats of the finishing material as necessary. Surfaces where the existing finish has deteriorated extensively shall be stripped using either chemical stripper or a blow lamp. The wood must not be damaged or scorched should a blow-lamp be used. Chemical strippers shall be used strictly in accordance with the instructions. The stripped surfaces shall be prepared as for new work.

17.12 PLYWOOD

Plywood shall be primed and grain filled.

17.13 PLASTERBOARD

Any dents or imperfections in the surface shall be filled with a suitable filler.

17.14 PLASTERED SURFACES

All loose dust, plaster splashes and the like shall be removed, dents or imperfections filled and the walls generally lightly sanded and cleaned down to leave a smooth, level and uniform surface.

17.15 BLOCKWORK

All loose dust shall be removed and the pointing of the blockwork checked and made good as necessary to provide a regular surface.

17.16 CONCRETE

All mould oil shall be removed by scrubbing with water and detergent. Loose dust shall be removed and imperfections shall be filled and sanded down to provide a smooth surface.

17.17 LEAD AND COPPER

Surfaces shall be washed with soap and water, roughened with abrasive paper and washed with white spirit.

17.18 ALUMINIUM

Surfaces shall be washed with white spirits and either carefully roughened with abrasive paper or treated with etching solution in accordance with the manufacturer's instructions.

17.19 PLUMBING

All exposed metalwork in ducts to be thoroughly wire brushed and painted with two coats of rust inhibiting paint. Pay special attention to the pipe supports in under floor ducts, ensuring that they are completely protected against corrosion.

17.20 GENERAL

All exposed metalwork within the building to be thoroughly wire brushed and painted one coat of rust inhibiting paint and two coats of an approved colour finishing paint. Walls with plastered background finish generally to be prepared and painted with three full coats of Vinyl Silk Emulsion Paint. Ceiling with plastered background finish generally to be prepared and painted with three full coats of vinyl matt emulsion paint.

Hardwood surfaces are to receive three full coats of polyurethane varnish.

Exposed copper piping, steel conduits and steel radiators are to receive one undercoat, and two coats of heat resistant paint.

17.21 INSPECTION

NO painting will be commenced until the preparatory work has been completed to the satisfaction of the Employers Representative or his representative. NO subsequent coat shall be applied until the previous coat has hardened, been prepared, rubbed down and similarly approved.

18. DRAINAGE

18.1 GENERAL

The Contractor shall be responsible for all below ground sewerage/foul and surface water services and connection of all soil and waste pipe to the existing drainage system.

The Contractor will provide all builders work in connection with trench excavation and disposal of surplus material and reinstatement as described below.

18.2 MATERIALS

Materials shall comply with the following specifications

Precast concrete pipes and fitting	- IS 6, 166 BS 5911
Field drain pipes	- BS 1194, 65, 540
UPVC pipes and fittings	- IS EN 1402, IS EN 13476, IS EN 23598-1, BS 4660, 5481,
Concrete manholes	- BS 556, IS20, 91, 189
Manhole covers and frames and gratings	- EN 124
Manhole step irons	- BS EN 13101

18.3 GENERAL

All materials which the contractor proposes to use in the construction of the work shall comply with the requirements of the Irish Standard Specification latest publication the material shall be the best of it's kind available and to the satisfaction of the Employers Representative. In general a material having the Irish Standard Mark product must be used in preference to a material which does not have it. Concrete and polythene pipes having this mark are available.

18.4 PLASTIC PRODUCTS

Un-plasticised PVC pipes and fittings shall comply with BS 4514, 5255, 4660. Where using un-plasticised PVC gully traps and Armstrong Junctions the inlet and outlets must suit pipework and have gratings or covers as required.

18.5 AGGREGATES

Aggregates shall comply with IS EN 13242. The Coarse Aggregate shall be graded between the maximum size and 5mm. It shall be delivered to the site in separate sizes (20mm - 10mm to 5mm where the maximum size is 20mm; and 40mm - 20mm to 5mm where the maximum size is 40mm). Aggregates for use in lean concrete granular base shall consist of gravel 40mm nominal size combined aggregate, washed where necessary and complying with requirements of Standard Reference 3. It is assumed that sieving analysis will be carried out using B.S.S. sieves. Contractor to allow for costs of such tests in his rates.

18.6 HARDCORE

Hardcore for filling shall comply with SR 21.

18.7 GRANULAR BEDDING IN PIPELINES

Bedding material shall comply with WIS 4-08-02 and IGN 4-08-01.

18.8 PIPEWORK

All pipework and associated fittings will be uPVC, Wavin Pipes or equal approved.

18.9 ACCESS JUNCTIONS

Use Wavin 110mm Access Junctions, or equal approved, complete with risers as necessary, frame and cast iron cover.

18.10 JOINTS

All joints to be ring sealed socket joints.

18.11 WORKMANSHIP

Drainage work generally shall comply with BSCP 301, SR 7 and technical Guidance Document H (Building Regulations 1991), and shall comply with the requirements of the local Authority. Work will also comply with the following relevant standards:

BS 5572 : 1978	Code of Practice for sanitary pipework
BS 6367 : 1983	Code of Practice for drainage of roofs and paved areas.
BS 8301 : 1985	Code of Practice for building drainage
BS 5911 : 1982 Part 2	Precast concrete pipes, fittings and ancillary products:

Set out the Works to the correct positions, levels, dimensions, gradients and alignments and shall provide all necessary facilities and equipment for this purpose.

Excess excavation below the required levels shall be filled up to the correct level with 1:12 concrete, or as the Employers Representative may require, at the Contractor's expense. The bottoms of excavations must be inspected and approved by the Employers Representative before any further Works are commenced.

Only lay foul and surface water drains and sewers in the same trench where he is either directed to by the Employers Representative or obtains the Employers Representatives approval. Except where specifically stated to the contrary trenches have been measured on the basis of one pipe being laid in each trench. Should the Contractor receive approval to lay more than one pipe in a trench he shall be responsible for any extra costs arising from providing extra supports, staggered backfilling, revised bedding and surrounding, etc Rates will be revised pro-rata the designed widths and depths of the trenches.

Temporary or permanent supports to pipes such as bricks, blocks, timber etc shall not be used except where specified. Where a concrete bed is required to pipes a 50mm thick initial layer of concrete shall first be placed across the width of the trench. The pipes shall be laid, jointed and supported on precast concrete blocks which shall be separated from the pipe barrel by 25mm thick softwood packings. Backfilling of the trench shall not be carried out earlier than 36 hours after laying of the concrete.

Excavations shall be backfilled with either selected excavated material or granular material. Selected excavated material shall be dry, clean and capable of compaction to form a stable dense fill. It shall exclude the following

1) material from marshes or containing peat, vegetation or perishable matter.
2) material which by nature of its physical or chemical composition, frozen state, combustibility or moisture content will not compact to form a stable fill.
3) lumps exceeding 150mm in any direction.
4) builders rubbish
5) organic clays or silts
6) chalk or clay which is soft or wet.

Granular material shall comprise natural sands, gravels, crushed rock, concrete slag or hard brick, or well burnt non plastic shale. It shall pass a 75mm ring and shall be suitably graded with sufficient fine material to fill voids and produce a dense stable mass when compacted. Gravel in beds and surrounds shall be single sized irregular course aggregate complying with BS 882 table 1 and of the following nominal size.

Pipes not exceeding 500mm diameter 10mm
pipes over 500mm diameter 20mm

Gravel beds shall be well compacted and shall extend the full width of the trench with sufficient material at the sides to permit the pipe to be worked into the material and be firmly supported true to level and line. When the level and line are satisfactory the side filling shall be placed in 75mm layers and compacted before the covering to the pipe is placed in 75mm layers and thoroughly compacted ensuring that all spaces between the trench sides and pipe are filled. Drainage bed widths are in all cases the minimum required and the rates quoted by the Contractor in his Schedule of Rates are those which will be paid for the work regardless of what width the Contractor chooses to excavate the trench to.

The starting levels from which excavation items are described in the drawings are measured. The Contractor shall be responsible for any extra costs arising from his decision to choose a different starting level, should he do so.

Flexible mechanical joints shall be formed in accordance with the manufacturer's instructions. Joints to cast iron pipes and fittings shall be made with a synthetic seals.

Rigid joints to concrete or clay ware pipes and fittings shall be made with synthetic seals placed into the socket. Pipes passing through walls or foundations shall have sleeves around them to allow a clearance around the pipe. The first 300mm of backfilling above the crown of the pipe shall be compacted by hand. The remainder of the backfilling shall be placed in 150mm layers and mechanically compacted. Granular material shall be used in trenches under buildings or paved areas. Elsewhere, selected excavated material shall be used.

18.12 SCOPE

All drainage work up to and including gullies and connections to W.C's soil vent pipes and rainwater conductors is to be executed in accordance with this specification.

18.13 ORDER AND EXECUTION OF THE WORK

Before commencing work on the site the Contractor shall submit for approval a programme for the execution of the works which shall allow for carrying out of drainage works after formation level is achieved.

18.14 NOTICES

Before commencing any of the proposed works, notify the Employers Representative and any other affected authority of intention to proceed with the works and shall satisfy the Employers Representative of each authority as to precautions to be taken to preserve all underground or over ground services in the vicinity of the works. He shall comply with all statutory regulations, pay any fees arising therein and serve such notices as are required.

18.15 SETTING OUT

At the commencement of the works and before the existing ground is disturbed the contractor shall signify his agreement to the correctness of the existing ground levels as indicated on the drawings. After setting out any drainage works which are related to existing levels but before the ground is disturbed, the existing ground and other relevant levels shall be checked in order that the details of the proposed work may be confirmed or if necessary amended.

18.16 LOCATION OF EXISTING SERVICES

Ascertain the position of their apparatus and allow for checking the correct nature and location of all services by trail holes or other means before commencing general excavation. Diversion of existing services will only be paid for where the Employers Representative orders previously unforeseen work necessitated by the permanent construction.

18.17 CONTROL OF TRAFFIC TEMPORARY SIGNS, ETC

If required, erect and maintain on the works and at prescribed points on the approaches to the works, traffic signs for the direction and control of traffic to the satisfaction of the Employers Representative including the provision of approved adequate illumination.

18.18 TEMPORARY WORKS

Provide, maintain and remove on completion all temporary works for the proper and safe construction of the permanent works and for the protection and security of all adjoining property including services, watercourse, footpaths, fences and the like. All vehicle and pedestrian access to property shall be maintained in a safe condition.

18.19 COMPLETION OF DRAINAGE WORKS

Before any general excavation or filling is commenced on the Site, sufficient permanent and temporary drainage works shall be carried out to provide drainage works shall be carried out to provide adequate outfalls for all surface and subsoil water, including watercourse and pipes which will be severed by the execution of the works. Where necessary provide pumps or other methods to maintain outfalls at all times. During construction and on completion all drains, manholes, catch pits and gullies shall be kept clean and free from accumulation of silt, etc. Any sub-soil drain, jointed pipe, manholes, catch pit or gully which cannot be cleaned shall be replaced at the contractor's cost.

18.20 CONNECTIONS TO EXISTING SEWERS

Before entering or breaking into an existing sewer give notice of his intention to the appropriate authority so that their representative can be available for supervision of the work. Where pipes are to be connected to existing manholes, channels shall be formed in the benching, the chamber walls cut at the correct level and the new pipes built in together with any backdrops necessitated by the difference in level of the existing and new pipes.

Where a new manhole is to be constructed on an existing sewer, allow for locating the sewer and checking its level before commencing to construct the drain run to be connected thereto. Where pipes discharge into watercourses the ends of the pipes shall be supported and the banks protected by concrete head walls constructed so as not to impede the flow in the channel. When working in existing sewers, and watercourses provide for dealing with existing flows to enable the new work to be properly completed.

18.21 GENERAL EXCAVATION FOR PIPE LINES, MANHOLES, CHAMBERS, ETC.

Except where headings are specified, permitted or otherwise ordered the ground shall be excavated to the lines and depths shown on the drawings or to such other lines and depths directed by the Employers Representative. Trenches shall be of sufficient width to enable the pipes to be properly laid and jointed and shall be excavated for full depth with vertical sides. Excavations taken out to a greater depth than necessary shall be filled to the required level with concrete at the contractor's own cost. Where a concrete bed or surround is required to the pipeline, manhole, A.J. etc., the excavation shall be taken out to the overall dimensions of the bed or surround. Any additional excavation shall be filled with concrete at the contractor's own cost.

Where pipes occur at or below existing ground under fill, they shall be laid before placing the fill material unless otherwise directed by the Employers Representative. Excavation at or near the toe of cutting or embankment slopes shall be carried out in such a manner that there is no excavation into the slope for working space and the trenches shall, unless the Employers Representative agrees to their being left open for a longer period, have the pipe line completed and be backfilled at the end of each day's work.

Surplus excavated material shall be promptly removed to tip off site and spoil heaps or uncollected rubbish shall not be left along trench lines on any site. Whether excavating by hand or machine, prevent disturbance or softening of wet fine grained soils such as clays, silts and fine sands in the trench bottom, by proper drainage and by placing a blanket of coarse sand and gravel or other approved granular bedding material on the virgin formation as soon as it is uncovered. No traffic shall be allowed in the trench bottom until this blanket is in place. In very soft ground this blanked shall be additional to the normal bedding required for the pipes. Peat or boggy material before formation level shall be removed and replaced by sand or other approved stable filling materials.

18.22 SUPPORTS OF EXCAVATION

The sides of the pits, trenches and other excavations shall be adequately supported to the satisfaction of the Employers Representative by timber and other approved means. The excavation shall be of sizes sufficient to provide the required space inside the supports. Take all precautions including any necessary shoring and propping, etc., to ensure the safety of adjoining structures and property of all kinds including supporting existing services. Where directed by the Employers Representative supports shall be left in, and any such supports so left in will be measured and paid for except where in the opinion of the Employers Representative the necessity for leaving the supports in has resulted from the carelessness or neglect of the contractor.

18.23 WATER IN TRENCHES

Trenches shall be kept free from water and shall be shaped to prevent any accumulation of water either in or adjoining the excavation of the spoil therefrom. Provide any temporary drains, sumps, pumps, etc. that may be necessary and shall at all times during the contract, prevent silt, oil or other contaminating material being discharged into existing or completed drains, watercourses or soak ways. Catch pits or other means necessary to comply with this requirement shall be provided and kept clean by the contractor at his own cost.

18.24 ROCK

The term shall be taken to mean any material met in excavation which is of such size or position that it can only be removed by means of wedges, compressed air or other special plant or explosives. Soft surface rock or the soft top rock or rock easily removable shall be classified and paid for at normal excavation rates. The Employers Representative's decision in this is binding. The item included in the Appendix D for hard rock excavation is provisional and only that quantity actually removed will be paid for as an extra on normal excavation. Where rock is met in trenches it shall be excavated and trimmed to prescribed level of underside of the pipeline.

Rock excavation shall also be deemed to include solid boulders of 0.25 metres or over in volume.

18.25 EXPLOSIVES

The use of explosives for excavation will not be allowed.

18.26 REFILLING TRENCHES

The initial layer of backfill material, shall not be thrown directly onto the pipes but he carefully placed and consolidated in thin layers by hand up to at least 300 above the top of the pipe or special surround. Backfill around pipes, including concrete or other special materials shall be carefully packed under and around the pipes. Filling above the initial layer shall be deposited and compacted in layers not exceeding 225 loose depth. Great care shall be taken in all cases to ensure that the filling is fully compacted and rammed against the sides of the trench.

18.27 REFILLING TRENCHES UNDER CARRIAGEWAYS

The contractor will not be permitted to use plant or any method of backfilling trenches which would render it impossible to fill and compact in 225mm layers as specified. Maintain the surface of refilled trench level with adjoining surfaces free from pot holes, depressions, etc., pending construction of new road surfacing.

Trench supports shall be withdrawn ahead of the layer to be supported, care being taken to keep the side of the trenches solid and to fill all the spaces left by the withdrawn supports. Mechanical appliances may be used for

compaction of backfill above the initial layer, providing the appliance is suitable for the conditions and will not damage or displace the pipes. Make good any such resulting displacement or damage at his own expense.

18.28 SURFACE REINSTATEMENT OF PAVED AREAS

Outside the boundary of the site, trenches through paved areas shall be refilled and compacted up to the underside of the existing paving construction (including any sub-base) in accordance with the measured work section. Above this level, the reinstatement shall be of similar construction to the original, to the satisfaction of the owner or appropriate authority. Allow for the placing and maintenance of temporary reinstatement. The permanent reinstatement shall not be placed until settlement of the trench is completed.

18.29 CONCRETE BED TO PIPES

Where indicated on the drawings pipes shall be laid on a bed of concrete of the width and thickness shown on the drawings. The bed shall be laid true to line and level to an even surface ready for laying the pipes. Concrete in beds and surrounds shall be placed within one hour from the time of mixing. Under no circumstances shall reconstituted concrete be permitted. If directed by the Employers Representative the bed shall be reinforced or supported on piles.

18.30 GRANULAR BEDDING TO FLEXIBLE JOINTED PIPES

The construction of beddings for flexible jointed pipes shall be generally in accordance with the recommendations of Special; Report No. 35 issued by the British Ministry of Public Building and Works (HMSO) and Technical Bulletin No.1 Construction of Flexibly Jointed Concrete Pipelines. Standard Reference 27. Bedding shall be well compacted and brought true to line and level providing a depth not less than the values given in the detail drawings. Side fill shall be thoroughly compacted and completely fill the space between the sides of the trench and the pipe.

18.31 LAYING AND JOINTING PIPES

Set up and maintain bench marks on site. Sight rails shall be set up for all lines of drains. Sight rails shall be of wrought deal at least 150 x 25 securely fixed to two substantial uprights firmly driven into the ground. Sight rails shall be erected not more than 45m apart and at each change of gradient line and level.

Pipes shall be laid true to line and level each pipe being separately bonded between sight rails.
All pipes shall be laid with the whole of the barrel of the pipe evenly and solidly supported by the bedding material with shaped holes to receive sockets or jointing collars.

18.32 PIPES WITH FLEXIBLE JOINTS

Flexible joints shall be made to the manufacturer's instructions with 12mm gap between the end of the spigot and back of the adjoining socket, (or spigot where jointing collars are used). The exterior of the joint shall be sealed with stone free cohesive soil or equivalent material to prevent the entry of granular material into the joint.
Jointing rings shall be carefully stored with the separation of natural and synthetic rings and those supplied by different pipe manufacturers. Completed pipe lines shall have a smooth internal bore free from lipped joints, jointing or other material. Where waterlogged soil conditions are encountered the final excavation of the trench shall not be carried out until the contractor is in a position to place the granular bed.

18.33 CONTRACTOR HAUNCHING AND SURROUNDS TO PIPELINE

Pipelines shall be haunched or surrounded with concrete where required in the manner indicated in the detailed drawings. In carrying out this work take every care to knot in haunch and/or surround concrete with the previously laid bed and to ensure that the whole is solid and homogenous. In no instance shall concrete be thrown directly

onto the pipes and during the placing of the concrete the pipelines shall be adequately supported so that they are not disturbed in any way.

When each length has been tested and approved the concrete haunching as required shall be placed. The concrete shall be carefully packed under the pipe barrels so that no space is unfilled.

18.34 SUBSOIL DRAINS

French drains shall be laid to falls. Except where laid under special conditions such as at the rear of retaining walls, trenches shall be 200 wide for drains up to 150 diameter, the trench shall be back filled with 20 or 40 graded gravel or broken stone.

Any existing land drains intercepted shall be cleaned out and connected direct to the new pipes and the disused end of the old drain sealed with puddled clay.

18.35 DRAINS UNDER BUILDINGS

Drains laid under buildings shall have at least two flexible joints between each point where the pipe line is built into and supported by the structure. Concrete surround shall be formed to permit flexible joints. Redundant drains within the building are to be filled with lean mix concrete, sealed and made good all round.

18.36 TEMPORARY STOPPERS

The open ends of drains runs and junctions shall unless work is proceeding, be fitted with expanding stoppers. The position of all such ends of pipes shall be clearly defined by stakes and labelled. Temporary drainage on the site shall not be connected to new sewers unless adequate measures have been taken to prevent the discharge of silt, oil or other contaminating materials.

18.37 TESTING OF PIPELINES

All sewers, manholes, chambers and other work shall be absolutely watertight. In order to make sure of this the sewers shall be subjected to a water test. No sewer shall be covered up until it has satisfactorily passed the test. The pipes shall be tested in sections (e.g. between manholes). Each section shall be tested by filling with water and testing to a head of not less than 1.0 metre and not greater than 2.4 metres. The head shall be maintained for 30 minutes. Any pipes or joints which show signs of leakage or sweating during the period of test shall be taken out and replaced or re-jointed at the contractor's expense until completely watertight. In the case of large sewers of internal diameter 450mm or over the Employers Representative may permit an air test for the water test. A suitable air pressure shall be built up with a tube. Pressure shall be built up to 150mm for 5 minutes without a drop of 25mm on thermometer tube the test will be regarded as satisfactory. If the pipeline fails under the air test a confirmatory water test shall be applied without extra cost on the contract.

Invert channels shall form a vertical transition between the gradients of the incoming and outgoing sewers and where there is c a change in horizontal direction of these sewers, the channel shall be curved in plan to the largest possible radius. The channel shall be accurately finished to a smooth curved surface with purpose made channels. The sides of the main channels above half diameter shall be vertical up to the level of the soffit of the inlet pipe. Benching shall have a minimum fall of 25mm from back to front and 25mm radius nosing to the channel, the whole of the benching and vertical sides of the channel to be finished in 1: 3 cement mortar rendering.

Rendering shall be finished to a smooth hard surface with a steel trowel in 19mm of 1: 3 cement mortar. Where detailed, galvanised step irons to B.S. 1247 are to be fixed in manhole and shaft walls.

Manhole covers and frames to be of the pattern specified and shown on the Drawings. Frames to be bedded in 1 : 3 cement mortar on 8 No. concrete bricks with the surface flush with the existing or proposed adjoining ground levels. Normally acceptable tolerances will be within the range of true level and 6mm low. The covers and frames shall be coated before delivery by hot dipping in an approved bituminous material. Any damage to the bituminous material during transit or fixing shall be made good. Two sets of manhole lifting keys for each type of manhole shall be provided and handed over to the Employers Representative's representative as soon as fixing of the covers commences.

18.38 BLOCK MANHOLES

Blocks shall be solid building blocks to IS EN 771with average compressive strength of 15N/mm2. Blockwork shall be laid 225mm thick in stretcher bond on 150mm C28/35 XC2 concrete base with all joints filled solidly in (1: 3) cement mortar and neatly flush pointed internally as the work proceeds. Joints shall not exceed 10mm in thickness and no liquid grouting of the joints will be permitted. The whole of the blockwork shall be set level, straight and carefully plumbed. Pipes up 300mm diameter to be arched over in blockwork. Manholes should be rendered internally in (1: 3) cement mortar 19mm thick and finished with a steel trowel.

18.39 CONNECTION TO EXISTING MANHOLES

The Main Contractor is required to carefully excavate outside existing manholes where required and break into blockwork wall, insert branch channel, including making good to wall and benching and sealing pipe and channel.

Trenching

Size of Pipe	Trench Width	Depth of Trench	Bed & Surround
100mm uPVC	600mm	As required	Class B Granular Material 10mm nom size aggregate to BS 883
150mm uPVC	600mm	As required	Class B 10 or 14mm nom size aggregate to BS 883

18.40 SURFACE REINSTATEMENT OF PAVED AREAS

The Contractor shall be responsible for reinstatement of trenches and making good of surfaces to match existing between macadam paving. The minimum width of trench is as outlined above and the width of reinstatement is the responsibility of the Contractor.

18.41 LAYING OF BITUMEN MATERIALS

The material shall be laid in accordance with Appendix A BS 4987: Part 2.

18.42 SUB-BASE

All materials shall be placed and spread evenly. Spreading shall be undertaken either concurrently with placing or without delay. Road base material shall be spread using a paving machine or a spreader box approved by the Employers Representative. The material shall be spread in one layer so that after completion the total thickness is as specified. Compaction shall be completed as soon as possible after the material has been spread. The surface of any layer of material shall on completion of compaction and immediately before overlaying be well closed, free from movement under compactor plant and free from ridges, cracks or loose material. All loose segregated or defective areas shall be removed to the full thickness of layer, re-laid with new materials and re-compacted.

18.43 TEMPERATURE OF MATERIALS

Before coating the aggregate shall be surface dry. The Macadam shall be mixed and delivered to site within the following range of temperatures:

Wearing Course - 105 °- 130°C

All joints to be sealed with a tar sealer.

Treat sub-base with a weed killer. Compact sub-base in layers NOT exceeding 150mm with 4 passes of 3.5 tonne to 4.5 tonne per metre with vibrating roller. Compact each coated macadam asphalt layer using (to 3 tonne) smooth wheeled roller, 450mm min. width, each roll overlapping by half of the previous one. Each layer shall be laid to even falls.

19. SITEWORKS GENERALLY

19.1 GENERALLY

Set up and maintaining a site datum level accurately ascertained from this reference point and for clearing it away on completion of the Works. Provide all necessary trench excavation, ducting, backfilling and reinstatement of trenches.

19.2 NATURE OF THE GROUND

The Contractor will be deemed to have satisfied himself about the nature of the ground. Basic excavation rates will be deemed to include for excavation through all material occurring in the ground other than solid rock as defined in the 'Definitions' Section herein. Rates shall also include for grubbing up roots and other natural obstructions encountered. The information given hereafter is supplied as an indication only and NO warranty or guarantee is given that the information about the nature of the ground is either complete or typical of the site.

19.3 SERVICES

Notify the Employers Representative as soon as any under or over ground service not shown on drawings or described herein is discovered. Approximate locations of existing services can be obtained from the Barrack Foreman of Works. However, it remains the responsibility of the Contractor to locate all services in the vicinity of the works.

19.4 GENERAL EXCAVATION

For the purposes of excavation formation level is defined as the maximum site level permitting the Contractor to lay the minimum quantities of hard or soft filling, depending on location, specified as being necessary to achieve the finished ground or floor level required.

19.5 EARTH FILLING

Where earth filling is described as being deposited and compacted in layers it shall be spread and levelled in 225mm thick layers and well rammed, watered and consolidated into a compact mass by means of a vibratory roller weighing not less than 1 tonne making not less than three passes running at slow speed.

19.6 EARTHWORK SUPPORT

The term earthwork support shall mean providing everything necessary to uphold the sides of excavations, whether the Contractor decides to provide support or to over excavate and ramp the sides. The Contractor will be responsible for supporting the sides of the excavation and will be deemed to have included in his rates for all the work required.

19.7 UNAUTHORISED EXCAVATION

Trenches and pits shall be excavated to the depths and widths shown on the drawings or directed by the Employers Representative. Should an excavation be made below the level required the Contractor shall be liable for the cost of reinstating the ground to the required level with approved filling material. Should the material excavated be rock the over excavation shall be made up in concrete of an approved mix.

Should the widths of the trenches or pits be greater than the designed width of the foundation the Contractor shall be liable for the cost of any extra work necessary to achieve a foundation satisfactory to the ER.

19.8 DISPOSAL OF WATER

Keep the excavations and the surface of the ground free of water. Water must not be disposed of into the permanent drainage system.

19.9 HARDCORE

All new fill material shall comply with Annex E of SR 21.
Hardcode shall mean hard stone, concrete, coarse gravel or hard broken brick, free from unsuitable filling material and capable of passing through a 100mm diameter ring.
The material shall lie within the following grading limits.

Sieve Size	% by weight passing
75mm	100
37.5mm	85 - 100
10mm	40 - 70
5mm	25 - 45
.600mm	8 - 22
.075mm	0 – 10

Material passing a .425mm sieve shall be non-plastic. The particle size shall be tested in accordance with BS 1377. Material used shall be frost resistant. Granular material shall be laid and compacted at a moisture content within the range of 5 to 8% depending on the material or at such other moisture content as shall be decided by the Employers Representative.

19.10 UNSUITABLE FILLING MATERIAL

Unsuitable filling material shall mean perishable material, material from marshes or bogs, stumps, slurry, mud, material susceptible to spontaneous combustion or material in a frozen condition. Clay of liquid limit exceeding 80% and or plasticity index exceeding 55 as determined in accordance with BS 1377 shall not be used. Materials with a water soluble sulphate (in S04 form) content in excess of 0.1% shall be excluded as shall materials having a moisture content greater than the maximum permitted. For cohesive soils the permitted moisture content shall be not greater than the soils plastic limit multiplied by 1.1.

19.11 PLACING HARDCORE

Hardcore shall be laid in 150mm thick layers and have a top blinding layer of 50mm thick sand or gravel. It shall be consolidated to an even surface and to the required levels and contours with a 3 tonne roller or equivalent. Compact hardcore under paths and paving for pedestrian paving with a similar roller and compact hardcore under paving to take vehicle traffic with a 10 tonne roller.

19.12 SOFT SPOTS & UNSUITABLE MATERIALS

Soft spots or other unsuitable material(s) encountered during excavation shall be removed and replaced by C8/20 top quality concrete/imported granular fill. No payment shall be made for any excess excavation not approved prior to execution. Such excavation shall be filled as above at the Contractor's expense.

19.13 TRENCH EXCAVATION

Excavate all necessary trenches for ducting. Minimum trench depth shall be 1000mm deep below ground level with minimum 750mm cover. Include for backfilling with selected excavated material, compacting and disposal of surplus spoil. Excavated material not required for backfilling shall be promptly removed from the site. The Contractor shall refer to the Employers Representative before work begins to ascertain whether there are any underground services in the area. The Contractor shall protect such services during the course of the works and shall include for all excavation work around such services. Damage caused to such services shall be made good by the Contractor at his own expense. No work is to be covered up until inspected and passed by the Employers Representative or his representative. During the tender period and before work begins, the Contractor shall refer to the Employers Representative to locate the exact location of all trenching.

19.14 BED AND SURROUNDS

A 150mm thick bed of sand shall be laid to the full width of all trenches. Provide and lay concrete grade 20N20 over the duct piping where called for to roads and driveways. The cover to the crown of the duct shall be a minimum of 100mm to the full width of the trench, and shall be well tamped. Concrete to comply with BS 8110 and shall not be placed if the temperature is below 2 degrees Centigrade on a rising thermometer, or 3 degrees Centigrade on a falling thermometer. Allow for all necessary works. Note that all haunching shall be laid under all tarmac surfaces only.

Under concrete paths backfill with selected excavated material up to the hardcore base. Under grass backfill with selected excavated material. Under gravel backfill with selected excavated material to the base of the crushed stone surface. All backfill shall be levelled and compacted in layers of maximum thickness 150mm.

19.15 TRENCHING

Type of Duct	Trench Width	Depth of Trench	Cover	Bed & Surround
Polyurethane Gas Main	400mm	1000mm	750mm Cl 804 stone	150mm sand
100mm duct for SWA Cable	400mm	1000mm	750mm Cl 804 stone	150mm sand
Watermain/foul	300mm	1000mm	750mm Cl 804 stone	150mm sand

19.16 SURFACE REINSTATEMENT OF PAVED AREAS

The Contractor shall be responsible for reinstatement of trenches and making good of surfaces to match existing between macadam paving. The minimum width of trench is as outlined above and the width of reinstatement is the responsibility of the Contractor. The Contractor will be responsible for the provision of new surfacing in bitumen macadam to areas designated on external works drawings.

19.17 LAYING OF BITUMEN MATERIALS

The material shall be laid in accordance with Appendix A BS 4987; 1973.

Compact to required falls in accordance with SR 21

All materials shall be placed and spread evenly. Spreading shall be undertaken either concurrently with placing or without delay. Road base material shall be spread using a paving machine or a spreader box approved by the Employers Representative. The material shall be spread in one layer so that after completion the total thickness is as specified. Compaction shall be completed as soon as possible after the material has been spread. The surface

of any layer of material shall on completion of compaction and immediately before overlaying be well closed, free from movement under compactor plant and free from ridges, cracks or loose material. All loose segregated or defective areas shall be removed to the full thickness of layer, relaid with new materials and re-compacted.

19.18 PRECAST CONCRETE KERBS

Precast concrete kerbs shall be laid as shown and to BS 146, BS 340. Any unit of kerb and quadrant deviating more than 3mm from line and level at either end shall be made good by lifting and relaying.

Precast concrete kerbs 254 x 125 splayed or equivalent to match existing to IS 166 and BS 368 to be set in C8/10 foundation and concrete haunching. Splay where present to be above ground. Kerbs to be butt jointed with 1:2:6 cement/lime mortar. 255 x 125 precast drainage channel or equivalent to match existing on and including 500 x 200mm concrete base (Grade C28/35 XC2) with Granular sub-base haunched up one side including all necessary earthworks and formwork.

20. PAVING AND LANDSCAPING

20.1 MATERIALS

Materials shall comply with the following specifications:

Precast concrete kerbs	-	IS 146, BS 340
Bituminous macadam	-	BS 4987
Concrete paving slabs	-	BS 368

20.2 WORKMANSHIP

All work is to be carried out so that the finished surfaces are at the correct levels and are laid to true falls and cross falls. Surfaces excavated to receive paving or hard surfacing, including gravel surfacing, shall be rolled and thoroughly compacted. Soft spots shall be excavated and filled with well compacted gravel so that a uniform formation level is achieved. The formation level shall be left exposed for as short a period as possible prior to laying the sub-base. Any surfaces deteriorating due to exposure to the weather shall be excavated and brought back up to level with gravel at the Contractor's expense

20.3 IN-SITU PAVING

In-situ paving shall be worked up to and around obstructions, recesses and inserts. Where in-situ channels are to be provided the rate for the channel shall include for dishing the channel and finishing the surface. Arises, coves, ends, angles and intersections and working to outlets shall be provided as necessary to suit the section and layout of the channels. Where in-situ work is specified as being laid to cross falls the rate for the surfacing shall include for forming intersections.

20.4 PREFORMED PAVING AND EDGING UNITS

Fair edges, internal and external angles on preformed units shall be provided as necessary to suit the layout of the paving. Paving units shall be cut and fitted around obstructions. Where preformed work is specified as being laid to cross falls the rate for the surfacing shall include for forming intersections. Excavation, disposal and formwork shall be carried out as necessary for foundations to kerbs and edgings. Excavated material shall be disposed of offsite and water shall be disposed of on site. Ends, angles, intersections and cutting to outlets on channel linings shall be carried out as necessary to suit the layout of the channels.

Section C

Detailed Requirements

DESCRIPTION OF THE WORKS

Pearse Officers Mess – Fire Safety Works

21.0 Introduction

The works consist of fire safety works to replace existing Fire Detection and Alarm System (FDAS), Emergency Lighting (EL) system and complete vertical shaft compartmentation works to existing stairs and provide corridor subdivision along raised first floor corridor.

The project will include the following works:

22.1.1 PEARSE OFFICERS MESS

- New Fire Detection and Alarm System (FDAS) to L1 standard as per IS3218:2024, supplied drawings and detailed specification,
- Install cable tray for new FDAS,
- Provide fire protection to any fire resisting construction penetrations as part of the new FDAS,
- Remove existing FDAS (L4/L2 system) and all associated components,
- Make good surfaces and finishes following removal of existing FDAS,
- Provide confirmation of installation, commissioning and acceptance as per IS3218:2024,
- New PERC Automatic Test System Emergency Lighting (EL) as per IS 3217:2023, supplied drawings and detailed specification,
- Install cable tray for EL,
- Provide fire protection to any fire resisting construction penetrations as part of the new EL,
- Remove existing EL,
- Make good surfaces and finishes following removal of existing EL,
- Provide confirmation of installation, commissioning and acceptance as per IS3217:2023,
- Replaced all ceilings to S1-S6 stairs and first floor raised corridor,
- Establish protected shaft to vertical means of escape at stairs S1-S6, and
- Replace floor covering, paint walls including doors and ceilings in S1-S6 and first floor raised corridor F09A.
- The Contractor shall include all required services provisions as indicated in Defence Forces specifications, drawings and schedules. The Contractor shall cross reference and co-ordinate with Civil/ Structural and Architectural drawings and details to ensure the complete installation is co-ordinated and that all Works Requirements have been considered and included.

The overall project will be carried out by way of one contract. The contract documents, which this document will form part of, relate to this contract.

SPECIFICATION FOR
BUILDERS WORKS FOR
FIRE SAFETY WORKS, CURRAGH,
CURRAGH CAMP, Co. KILDARE

23. DEMOLITION AND ALTERATIONS

23.1 INTRODUCTION

Demolition work shall be carried out in accordance with BS 6187:2011

All materials arising from the Demolitions and Alterations shall, unless otherwise specified, be cleared away and removed off site as they arise. Materials shall be disposed of in accordance with relevant statutory requirements. Safe Disposal certificates for all hazardous materials removed from the site shall be provided to the Employer's Representative.

Materials on site, both arising from Demolitions and whether in skips or temporary mounds, and new materials stored pending incorporation shall be fully protected to ensure that they are contained and that no loose material leaves the site compound.

All floor, wall and ceiling surfaces adjoining, or exposed by demolitions and alterations work shall be made good to match the existing adjacent surfaces and left ready to receive redecoration / new works.

Removal of items listed includes all associated fixings, attachments and ancillary items.

23.2 ATTIC INSULATION

Remove and dispose of the attic insulation from above five (5) number stairwells indicated on drawing 1000 series drawings.

23.3 DOORS

23.3.1 DOOR LEAVES

Remove and dispose from site all doors called up for replacements as indicated on the drawings including:

23.3.1.1 Internal door leaves.

23.3.1.2 Include for removal and disposal of all attachments, ironmongery.

23.3.2 INTERNAL DOOR FRAMES

Remove and dispose from site selected door frames which are to be replaced as indicated on the schedule of existing doors drawing.

23.3.3 EXISTING ATTIC HATCHES

Remove existing attic hatch door sets as shown on drawings. Existing locations to be closed up or openings increased in size as per drawing. Closing of ceilings after removal of hatches is covered in ceiling section of this document.

23.4 ELECTRICAL & MECHANICAL STRIP OUT WORKS

23.4.1 ELECTRICAL SERVICES STRIP OUT

The Main Contractor MUST use a registered electrical subcontractor to identify and isolate the electrical services and certify that the installation is safe.

23.4.2 ISOLATION OF MAINS ELECTRICAL

Mains electrical power to be isolated to allow for selected electrical alterations such as the removal of existing lights, fitting of new lighting as per drawing, installations of motion sensors to lobbies and protected stairwells.

23.4.3 FIRE ALARM

Full removal of existing FDAS and all associated components.

23.4.4 REMOVE LIGHT SWITCHES

Remove light switches as indicated on drawings in the attic space. The switches will be removed with wiring stripped back to wall or floor/ceiling entry/exit and be blanked off with a sealed junction box. The contractor will remove all light switches on the entire attic level.

23.4.5 REMOVE LIGHT FITTINGS

Remove and dispose of light fixtures at attic level including Remove fittings from laundry room, cleaners store, mess office, room 25, ground and first floor corridors approaching protected stairwell number six 6 and lighting fixtures on the main first floor corridor.

23.4.6 REMOVE LIGHT FITTINGS

Remove and dispose of light fixtures as indicated on drawings including: remove all existing Emergency Lighting fittings; remove all light fittings in the attic space; remove light fittings below removed ceilings at stairs S1-S6 and first floor raised hallway F09A.

24. INTERNAL WALLS

24.1 PROTECTED SHAFT WALLS (TYPE 1, Gyproc System Reference C106048)

Stairway S1-S4 and S6 (ground floor to underside of roof), first floor elevated corridor subdivision and WEST wall of S5 stairs:

24.1.1 70mm Gypframe or equivalent metal stud partitions from floor to ceiling including;

24.1.2 70mm stud partition framing system, at 600mm centres complete with channels and noggins;

24.1.3 Where the heads of partitions are being fixed parallel to joists, the Contractor shall provide for construction up to the underside of the new ceilings with fire Batts;

24.1.4 Line door opening with 70mmx 44mm PAO timber grounds or fire door manufacturer recommended;

24.1.5 70mm x 44mm grounds for all electrical switches, etc.

24.1.6 1nr layer of 15mm Fireline plasterboard or equivalent on each side of the stud partitions.

24.1.7 Tape and joint with scrim cloth/ tape; all external corners to have an aluminium angle bead.

24.1.8 3mm gypsum plaster skim to the plasterboard to all areas.

24.1.9 Sealed with intumescent mastic (FireStrip) top and bottom to achieve a 30 minute fire rating.

24.1.10 Fire stopping of partitions where existing M&E services must pass through them.

24.1.11 Include for relocating services, switches and wiring.

24.1.12 At roof junction: Partition to be capped with one (1) nr layer of 15mm fireboard; maximum 20mm finished thickness mineral wool packed between new partition and existing roof line surfaces; apply intumescent fire protection paint to the roof trusses to give 30min fire protection, 600mm either side of the fire protected wall; allow for removal of ceiling section in the Protected stairwell shafts and first floor corridor sub-division to enable access to install the attic walling, include for joist timbers which may need be removed, and; make good any ceilings removed.

24.2 PLASTER REPAIRS TO WALLS

Make repairs to walls: after installation of new door sets, and; to prepare for redecoration.

Works to include: take down and remove from site the existing defective wall area; Clean down surfaces and leave ready to receive new work; Include for all joining up to adjoining surfaces, and; provide and apply a skim coat of 5mm finished thickness to surfaces.

25. CEILINGS

25.1 300mm ATTIC INSULATION

Provide and fit 300 mm thick Rockwool insulation or equivalent between and above the ceiling joists in the attic space in two layers of 150mm as follows: above six (6) number protected stairwell ceilings; above first floor main corridor from above F09A; shall comply with IS EN 13162; comply with TGD L achieving a U-value of $0.16 W/m^2K$; top layer perpendicular to bottom layer; fit as per manufacturer's instructions, and; see drawing.

25.2 NEW CEILINGS

Under timber joists to all stairs S1-S6 at ground floor and first floor level and above first floor raised floor.

Existing timber joists to exceed minimum 38 mm x 150mm timber joists at maximum 600mm centres, with suitable timber noggings between joists to support board edges, 30-min: Gyproc Industries plasterboard with joints taped and filled and backed by timber [joist or noggin] Fireline: 2 x 12.5 mm.

Counter batten existing ceilings at 400mm c/c with 50 x 30mm treated softwood. Tape and joint with scrim cloth/ tape; all external corners to have an aluminium angle bead. 3mm gypsum plaster skim to the plasterboard to all areas.

25.3 FIRE STOPPING

See section 29.12.

26. WOODWORK/ JOINERY WORKS

26.1 GENERAL

All internal doors shall be E30Sa (European) rated fire door sets. Doors to have been officially performance tested to the relevant parts of IS EN 1634 and classified as per IS EN 13501-2. Fire door assemblies to comply with BS8214-2026.

The Contractor shall produce compliance certificates for all fire door sets.

All ironmongery shall be satin finished, FSB manufactured or equivalent unless otherwise stated.

All products shall be fitted in strict accordance with the manufacturer's instructions.

Stated joinery sizes are finished sizes.

All architraves and door blocks to be red deal painted including: Adjust for all angles, ends, etc. including fair ends as necessary, and; Mitred angles.

26.2 NEW DOOR SETS

26.2.1 New Internal Single Door Sets Replacement

Doors sets as indicated on drawing and door schedule, including:

- 30 or 60min fire rating as specified on the door schedule;
- E30Sa Doors shall be minimum thickness of 44mm;
- E60Sa Doors shall be minimum thickness of 55mm;
- Threshold gap under or around any door not exceeding 3mm at any point;
- Doors to be solid cored, flush panelled, sheeted with plywood minimum 6mm thick, and faced both sides with 3mm thick oak veneer solid oak lipping's, minimum 10mm thick, all round left ready for clear finish;
- E30Sa - Door frames shall be hardwood, oak, 140 x 45mm thick rebated (12mm rebate); E60Sa - Door frames shall be hardwood, oak, 140 x 63mm thick rebated (12mm rebate);
- Frames to be fixed with galvanised mild steel frame anchors, three {3} number per jamb, countersunk and pelleted; for oil paint finish;
- Original frame widths above 140mm to be increased to match original frame width by installing a 30mm hardwood liner between outside face of new frame and architrave (This would see an existing 260mm double rebated frame replaced with a 140mm door frame and a 120mm hard wood liner); Existing 140mm brick walls and new Fire Partitions will NOT require liners;
- Bed all frames in intumescent mastic and fire batt between the wall and door frame top and sides and inside of each door;
- Intumescent 10mm fire door seal to be rebated into frame. Type 'DUFAYLITE' smoke strip or equivalent. Fit all fire strips, etc. as per manufacturer's instructions;
- Where vision panels and fanlights shall be 6mm thick Georgian wired plate glass set into fire resistant oak veneered non-combustible glazing channel, butt jointed at corners with oak cover beading (40 x 10mm);
- Where 60min fire ratings are required, vision panels and fanlights shall be Pyran glazing in fire resistant non-combustible glazing channel with ash cover beads (25x12mm);

- All fire-resistant glazing and glazing channels shall be bedded in intumescent paste; Provide and fit Ironmongery as per drawings and specification.
- All of the above requirements are minimum standards and where a fire test certificate indicates a more onerous requirement it is to be installed as per the fire test certificate set-up.

26.2.2 ATTIC HATCH DOOR SETS

Attic access door sets as indicated on drawing.

Provide and fit **Manthorpe** Fire-Resistant Drop-Down Loft Door or equivalent.

Model: GL280F

- Opening Size: Hatch size shall be clear opening of 562 x 726mm.
- Colour: white
- Comply with EN16034
- Include for the following:
- Trim out roof rafters to allow for attic hatches and form new attic hatches.
- Allow for new timber to create opening for new hatch.
- Bed hatch frames in intumescent mastic.
- All of the above requirements are minimum standards and where a fire test certificate indicates a more onerous requirement it is to be installed as per the fire test certificate set-up.

27. IRONMONGERY

27.1 GENERAL

All ironmongery shall be satin colour and shall be FSB or equivalent standard unless otherwise stated. The Contractor will provide three (3) number Master Keys which will ensure access to all the bedrooms and storerooms fitted with new door sets. The contractor shall supply two number single suites. The bedrooms will be on one suite and the storerooms will be on the other. Fit as per manufacturer's instructions.

Ironmongery schedule is drawing.

Ironmongery specification to the doors shall be as follows:

27.2 HINGES

Provide and fit three (3) number hinges, per door set. They shall have a melting point of not less than 800°C as per para B5.1 TGD B 2024.

Hinges type FSB or equivalent.

Phoenix Range 7230 BSS Hinge High Performance Shrouded Bearing Polymer Bushes (SB) 102 X 76 X 2.5mm Brushed Stainless Steel Integrate Bearings Certifire 60 Min Test EN1934 (2002) CE Marked 25 Year Guarantee.

27.3 INTUMESCENT HINGE PACKS

Provide and fit three (3) number intumescent hinge packs for all door hinges.

Intumescent hinge packs type FSB or equivalent.

1 MM THICK MONO-AMMONIUM PHOSPHATE INTUMESCENT PACK T/S HINGES

27.4 LOCK

Provide and fit one (1) number, sash lock to doors indicated on ironmongery schedule.

Sash lock type FSB or equivalent.

Type: 60MM BACKSET RC SS EURO CYLINDER SASHLOCK WITH SINGLE THROW 20mm BOLT.72mm C/C C/W STRIKE AND DUCTS POCKET. CE MARKED AND TESTED TO EN12209 CLASS 3 CATEGORY OF USE:

27.5 LOCK CYLINDER

Provide and fit one (1) number key cylinder to doors indicated on ironmongery schedule

Fit three (3) keys per door set.

Key cylinder type FSB or equivalent.

Type: GDN EK3/70 35/35 NI RP KEY & THUMBTURN CYL EN1303 AP2000 6 PIN EXTRA HIGH SECURITY ANTI DRILL - ANTI PICK HARDENED STEEL MULTI SUITED

27.6 ESCUTCHEON

Provide and fit two (2) number Escutcheons, to doors indicated on ironmongery schedule

Escutcheons type FSB or equivalent.

Type: FSB 1735/PZ SS ESCUTCHEON.

27.7 LEVER HANDLE SET

Provide and fit one (1) number lever handle set to doors indicated on ironmongery schedule

Lever handle set type FSB or equivalent

Type: FSB 1146 ER LEVER HANDLE SET KEY FEATURES: COMPLETE WITH STABIL SPINDLE/ SPRUNG LOADED TOLERANCE BEARING COMPENSATOR MANUFACTURED IN EUROPE (GERMANY) TESTED TO 1MILLION CYCLESIN EXCESS OF EN1906 M= 60Nm TORSIONAL RIGIDITY OF SPINDLE

F= 1300N TENSILE STRESS ON ASSEMBLED FITTING *0.5MM DEGREE OF SLACK ON HARDWARE AT REST SATIN STAINLESS STEEL.

Satin Finish

27.8 DOOR CLOSER

Provide and fit one (1) overhead door closer to doors indicated on ironmongery schedule

Fit type Union CE3F or equivalent per door set.

Satin Finish

27.9 DOOR STOP

Provide and fit one (1) number satin door stop, to doors indicated on ironmongery schedule

Fit door stop type FSB or equivalent

Type: SS OVAL SHIELDED FLOOR DOORSTOP.

27.10 FIRE DOOR KEEP SHUT SIGN

Provide and fit two (2) number “Fire Door Keep shut” sign, to doors indicated on ironmongery schedule

Fit “Fire Door Keep shut” sign type FSB or equivalent.

Type: 75MM SS `**FIRE DOOR KEEP SHUT**` SIGN.

DISC TYPE DSCK TO BS5499.

27.11 PUSH PLATE

Provide and fit push plate 1.6mm thick X 305mm X 76mm to doors indicated on ironmongery schedule

One {1} number only per door set.

Type Union 5000 or equivalent.

Satin Finish

27.12 KICK PLATE

Provide and fit two (2) number kick plate, to doors indicated on ironmongery schedule

Type: 900 X 150MM SS DSCK KICKPLATE.

Satin finish.

27.13 DOOR HANDLE

Provide and fit one {1} number to doors indicated on ironmongery schedule

Type Union or equivalent,

Size 306mm overall x 60mm projection x 45mm rose diameter mm.

Satin finish

27.14 PUSH BUTTON CODED LOCK

Provide and fit a Type Kaba Simplex, model no. 7104 or equivalent to doors indicated on ironmongery schedule.

Satin finish

27.15 DOOR SADDELS

Provide and fit new saddles to all new door sets.

Door saddle, 150 X 27mm, splayed in ‘Iroko’ or similar hardwood to each door.

Lengths shall be the width of the door opening, ends notched to door frames.

See drawing.

27.16 INTERNAL DOOR SIGNS

Include for the following:

uPVC with aluminium colour background with black text.

250mm long x 75mm high x 3mm thick

Door signs to following locations on the ground and first floors to read as follows:

- G01 Store,
- F01 Bedroom 16,
- F36 Changing Room,
- F09A First Floor Raised Corridor,
- F26 Bedroom 17
- F29 Showers,
- F30 Utility Room,
- G39 Staff Canteen
- F34 Main Distribution Board Room
- G34 Kitchen *(3 signs)*

28. PAINTING & DECORATING

28.1 GENERAL

The scope of the works consists of painting all new walls and ceilings, all areas below new ceilings (S1-S6 and first floor raised floor area F09A) repairs to wall finishes where new doors are fitted, new round and first floor ceilings. Colour to be selected by Employers Representative. Include for painting sample colours to selected surfaces.

All new surfaces are to be primed prior to painting, the primer chosen to suit the substrate and the finish that is to be applied.

All painting and decorating shall comply with BS 8000-12, BS 3046, BS 5493 and BS 6150.

Primer coats to seal new surfaces to consist of the following:

- Water based paints: add 10% water to 90% paint.
- Solvent-based paints: add 10% white spirit to 90% paint.

All surfaces are to be prepared prior to painting, to be left clean, dry and free from all contaminants.

- New surfaces to be wiped clean to leave free of dust, plaster residue, etc.
- Existing surfaces to be cleaned by working down thoroughly and made good
- Cracks and damaged plaster to be repaired with Pollycell - Polyfilla or equivalent and left ready to receive new works.
- Timber work to have cracks filled and to be lightly sanded all over to provide a key.
- All metal work to be wiped clean and sanded to ensure no loose material and provide a key.

New softwood timber to receive a coloured finish shall be knotted, primed, stopped and filled. Timber for a clear finish shall be sanded, primed and sanded again before applying the specified coating.

Ensure all paint coats are evenly applied to correct thickness with no drip marks.

Apart from primer coats, other paints shall not be thinned and shall be applied from the tin.

All paint finishes shall be brush or roller applied. Spray painting of finishes shall not be permitted.

Protection of built in furniture, the surfaces of built-in wardrobes are to be protected throughout works.

28.2 PAINTING SCHEDULE

The contractor is requested to paint the areas of the building indicated on drawing.

28.2.1 WALL SURFACES (New and existing below new ceilings at S1-S6 stairs, raised first floor corridor and repairs)

Soft sheen emulsion, DULUX or equivalent - 2 nr coats

Where wall surfaces in the stairwells have previously been painted in oil eggshell the Contractor shall provide and paint a first coat of oil primer and two {2} full coats of oil-based eggshell.

28.2.2 EXISTING WALL/ CEILING CONDUITS & AND HEATING PIPES

Soft sheen emulsion, DULUX or equivalent - 2 nr coats

28.2.3 NEW WALL/ CEILING CONDUITS & AND HEATING PIPES

Soft sheen emulsion, DULUX or equivalent - 2 nr coats

28.2.4 NEW CEILING SURFACES GROUND and FKIRTS FLOOR

Soft sheen emulsion, DULUX or equivalent - 2 nr coats

28.2.5 ALL EXISTING PAINTED TIMBER WORK (S1-S6 stairs and raised first floor area)

To include Doors, Skirting's, Architraves and Window Boards

One {1} coat of wood primer, two (2) oil undercoat and one {1} oil gloss coat.

28.2.6 ALL EXISTING VARNISHED TIMBER WORK (S1-S6 stairs and raised first floor area)

To include, Doors, Skirting's, Architraves and Window Boards

Clear satin varnish, Dulux Diamond Glaze or equivalent to internal hardwood doors – 3 no coats.

28.2.7 ALL HEATING PIPES AT SKIRTING LEVEL (S1-S6 stairs and raised first floor area)

Two (2) oil undercoat and one {1} oil gloss coat.

28.2.8 NEW SADDLE BOARDS

One {1} coat of wood primer, two (2) oil undercoat and one {1} oil gloss coat.

28.2.9 REFITTED ARCHITRAVES (S1-S6 stairs, raised first floor area and any repairs)

Fill all nail holes and butt joints with polly filla after refitting existing architraves.

One {1} coat of wood primer, Two (2) oil undercoat and one {1} oil gloss coat.

28.2.10 NEW ARCHITRAVES (Repairs)

One {1} coat of wood primer, two (2) oil undercoat and one {1} oil gloss coat.

28.2.11 EXTERNAL DOORS (All)

One {1} coat of wood primer, two (2) oil undercoat and one {1} oil gloss coat.

28.2.12 STEEL SUPPORT BEAMS FOR GRP TANKS

New and existing steel sections supporting new water tanks above protected stairwells are to be painted with intumescent paint.

28.2.13 Internal Steel Stairs handrails and bannisters S1-6

Two (2) oil undercoat and one {1} oil gloss coat.

28.3 RESILIENT SHEET FLOOR COVERING SYSTEMS VINYL SHEET FLOORING (S1-S6 stair areas, raised First Floor Corridor)

28.3.1 DESCRIPTION: SPECIFICATION FOR VINYL SHEET FLOORING GENERALLY.

28.3.2 BENCHMARK: POLYFLOR POLYSAFE PUR OR EQUIVALENT APPROVED.

28.3.3 PREPARATION

Base: Assessing suitability of bases

28.3.3.1 Existing bases

Notification: Before commencing work, confirm that existing bases will, be suitable to receive coverings. Suitability of bases and conditions within any area: Do not lay coverings on unsuitable bases and in unsuitable conditions.

28.3.3.2 New wet-laid bases

Base drying aids: Do not use for at least four days before moisture content testing. Base moisture content: Test in accordance with BS 5325, Annexe A or BS 8203, Annexe A. Locations for readings: In all corners, along edges, and at regular centres over general areas being tested. Laying coverings: Do not start until all readings show 75% relative humidity or less.

28.3.3.3 Trowelled finishes: Uniform, smooth surface free from trowel marks and other blemishes. Abrade suitably to receive floor covering material.

28.3.3.4 Prior to flooring: Condition of building and notification of commencement;

Building envelope: Weathertight and well dried out. Wet trades: Finished. Paintwork: Finished and dry. Conflicting overhead work: Complete. Floor service outlets, duct covers and associated fixtures: Fixed, where materials are to be cut. Notification prior to laying floor coverings (minimum): 48 hours.

28.3.3.5 Conditioning of flooring prior to laying

Standards: To BS 8203 and BS 5325.

General: Before laying; Condition materials by unpacking and separating in spaces where they are to be laid. Resilient flooring rolls; Maintain in an upright position. Carpet; Unroll and keep flat on a supporting surface.

28.3.3.6 Conditioning time and temperature (minimum)

Generally: As recommended by manufacturer. Materials stored or transported at a temperature below 10°C immediately before laying: Extend time by a factor of two.

28.3.3.7 Environmental conditions: Environmental conditions before, during and after laying

Temperature and humidity: Maintain approximately at levels which will prevail after building is occupied. Ventilation: Adequate. Underfloor heating before laying: Turn off at least 48 hours before start of laying.

28.3.4 SMOOTHING AND LEVELLING UNDERLAYMENT COMPOUND: SMOOTHING AND LEVELLING UNDERLAY COMPOUNDS

Description: Stopgap 300 HD Self smoothing compound. Manufacturer: F.Ball and Co. Ltd, Churnetside Business Park, Station Road, Cheddleton, Leek, Staffordshire, ST13 7RS. Material: STOPGAP 300 is dimensionally stable and is supplied as a pre-blended dry powder designed for application between 2 - 20mm. It is protein-free which allows it to be used in biologically sensitive areas such as hospitals.

28.3.5 SHEET

28.3.5.1 Type: Particle-Based Enhanced Slip-Resistant Polyvinyl Chloride (Pvc) Sheets Polysafe Standard Pur

Description: Specification for Vinyl Sheets. Manufacturer: Polyflor, Polyflor Polysafe Standard PUR. Standard: To BS EN 14041 and BS EN 13845. Slip resistance value (SRV) (minimum)/ Pendulum test value (PTV) (minimum): R10 / 36+(wet test – 4S Rubber/Slider 96). Surface Roughness Rz ≥20µm. Width: 2 x 20m. Thickness: 2 - 2.5mm. Colour and pattern: Cedar Blue 4060.

28.3.5.2 Fixing: To manufacturers recommendations –Wakol D 3320 or approved equivalent.

28.3.6 SEAMS: WELDED OR SEALED.

28.3.6.1 Samples Required: Product Samples

Manufacturer: As floor covering manufacturer. Submittals: Small samples of floor covering options. Purpose: For use as a reference sample. Labelling: Clearly label all submitted samples. Timing: Before ordering for project.

28.3.6.2 Execution:

Layout – setting out seams; Setting out of seams: Seams should be unobtrusive, kept to a minimum and positioned so that, where possible:

They run the length of an area. Traffic runs along rather than across them. Incident light does not strike across them. They are away from areas subject to heavy or twisting wear, doorways, stair nosings, or areas of narrow access.

28.3.6.3 Welded or sealed seams;

Materials: Hot welding rods. Commencement (minimum): 24 hours after laying, or after adhesive has set. Joints: Neat, smooth. Strongly bond. Flush with finished surface. Joints at doorways; Joint location: On centre line of door leaf. Installing coved skirtings. Installing: Dress sheet up over cove former and bond to background. Jointing: To manufacturers guidance.

28.3.7 SYSTEM COMPLETION:

28.3.7.1 Trafficking after laying;

Covering: Floor coverings generally. Traffic free period (minimum): Until adhesive is set. Refer to manufacturers recommendations.

28.3.7.2 Spare material;

Spare material to be supplied: Resilient sheet flooring. Quantity: To be agreed with Client. Timing: At completion.

28.3.7.3 Verification Of Performance Requirements

Submissions - Format: Description of inspections, remedial works carried out and certification of compliance. Timing: At completion of installation.

28.4 Carpet Flooring (Areas identified on drawings)

The Contractor shall provide Tretford Interlife carpet (or equal approved) including underlay, colour 517 Riviera. The contractor shall provide door saddles and all necessary carpet trims as required, to areas as identified on the construction drawings.

28.4.1 General - Construction: Loop (ondule); Pile Material: 70% Goat Hair, 30% Polyamid 6; Packing: Jute; Pile Insert Weight: 1,200g/m2. ; Pile Height: 5mm. ;Total Thickness: 7.2mm. ;Dimension: 200cm. ;Comfort Clacc: LC2. ;Stress Range: 23/33 (strong). ; Colour Fastness to Light: 5. ; Colour Fastness to Water: 4-5. ; Flammability: Cfl-s1 (B1). ; Thermal Resistance: 0.10m2K/W. ; Impact Noise Reduction: 22dB. ; Suitable for Office Chairs: No.

28.4.2 Colour and pattern: Subject to Client approval.

28.4.3 Third party certification: In accordance with the Carpet Foundation suitability factor.

28.4.4 Condition of building prior to laying: Building envelope: Weathertight and well dried out. ; Wet trades: Finished. ; Paintwork: Finished and dry. ; Conflicting overhead work: Complete. ; Floor service outlets, duct covers and associated fixtures: Fixed, where materials are to be cut. ; Notification prior to laying floor coverings (minimum): 48 hours.

28.4.5 Condition of Flooring prior to Laying: Standards: To BS 8203 and BS 5325.

28.4.5.1 General - Before laying: Condition materials by unpacking and separating in spaces where they are to be laid.; Resilient flooring rolls: Maintain in an upright position. ; Carpet: Unroll and keep flat on a supporting surface.

28.4.5.2 Conditioning time and temperature (minimum) - Generally: As recommended by manufacturer. ; Materials stored or transported at a temperature below 10°C immediately before laying: Extend time by a factor of two.

28.4.5.3 Environmental Conditions before, during and After Laying - Temperature and humidity: Maintain approximately at levels which will prevail after building is occupied. ; Ventilation: Adequate. ; Underfloor heating before laying: Turn off at least 48 hours before start of laying.

28.4.6 Primer to manufacturer’s recommendation.

28.4.7 Fixing: F. Ball Styccobond F3.

28.4.8 Setting out of carpet - Setting out: Set out from centre of area or room. ; Carpet along opposite edge: Of equal size. ; Edge strip: More than 50% of full carpet width.

28.4.9 Assessing suitability of bases:

28.4.9.1 Existing bases - Notification: Before commencing work, confirm that existing bases will, be suitable to receive coverings. ; Suitability of bases and conditions within any area: Do not lay coverings on unsuitable bases and in unsuitable conditions.

28.4.9.2 New wet-laid bases - Base drying aids: Do not use for at least four days before moisture content testing. ; Base moisture content: Test in accordance with BS 5325, Annexe A or BS 8203, Annexe A. ; Locations for readings: In all corners, along edges, and at regular centres over general areas being tested. ; Laying coverings: Do not start until all readings show 75% relative humidity or less.

28.4.9.3 Trowelled finishes: Uniform, smooth surface free from trowel marks and other blemishes. Abrade suitably to receive floor covering material.

28.4.10 Trafficking after laying - Covering: Floor coverings generally. ; Traffic free period (minimum): Until adhesive is set. Refer to manufacturers recommendations.

28.4.11 Verification of performance - Requirements for submission:

28.4.11.1 Format: Description of inspections, remedial works carried out and certification of compliance.

28.4.11.2 Timing: At completion of installation.

SPECIFICATION FOR
ELECTRICAL SERVICES FOR
FIRE SAFETY WORKS, CURRAGH,
CURRAGH CAMP, Co. KILDARE

29. GENERAL CONDITIONS

29.1 DESCRIPTION OF INSTALLATION

29.1.1 The general electrical services installation within Pearse Officers Mess shall generally be exposed with horizontal trunking, cable baskets / trays, conduit and cables surface / exposed below ceilings. The installation within the offices and canteen areas, will be concealed within ceiling voids above grid ceilings. General electrical services installations within the offices, Store locker areas and canteen shall where possible be flush in nature, with containment concealed within ceiling voids and recessed into building fabric. Services within the garage areas shall be surface mounted, installed in a highly neat manner intended to be exposed.

29.2 STANDARDS

29.2.1 All goods, products and materials shall be in accordance with the latest revision of Irish and EU Standards. All installations shall be in accordance with latest National Standard Authority of Ireland Wiring Regulations, Department of the Environment, Planning and Local Government, Building Regulations, and Technical Guidance Documents.

29.2.2 The complete installation shall comply with the latest codes of practice and any other legal requirements applicable to any element of materials, equipment and services provided under this works, even if an applicable code or legal requirement is not specifically referenced in the works documents.

29.2.3 The complete electrical installations shall comply with the Project Employer's Works Requirements documents.

29.2.4 The scope of work for the Contractor includes for the supply, delivery, positioning, erection, connection, testing, commissioning and setting to work, of all plant and materials necessary to provide complete FDAS and EL system to the satisfaction of the Engineer and in accordance with the various drawings, schedules conditions and contractual documents and the requirements of this specification.

29.3 CONSTRUCTION PRODUCTS REGULATION

29.3.1 All products, materials and equipment used on this project shall comply with the Construction Products Regulations. All Construction Products covered by harmonised European Standards must carry a CE mark. The EU Construction Products Regulation (No. 305/2011 - CPR) shall apply in full to all products and materials proposed for use on this project.

29.3.2 From the 31st December 2020, manufacturers, distributors, importers, and authorised representatives must comply with their obligations and responsibilities under Regulation (EU) 305/2011 when placing a construction product on the EU market.

29.3.3 Both authorised representatives and importers must be established in the EU-27.

29.3.4 UK Notified Bodies will lose their status as EU Notified bodies the end of the transition period. Manufacturers, distributors, importers and authorised representatives of construction products will need to take the necessary steps to ensure that they hold certificates under the responsibility of an

EU27 Notified Body to demonstrate compliance for products placed on the EU market post-Brexit. In practice, this means either:

- arrange for a transfer of their files and the corresponding certificates from the UK 'notified body' (a 'notified body' registered in the UK) to an EU-27 'notified body', or
- apply for a new certificate with an EU-27 'notified body'

Either step should be taken before the end of the transition period on 31st December 2020.

29.3.5 The UK Accreditation Service will cease to be a national accreditation body within the meaning and for the purposes of Regulation No 765/2008

29.3.6 The Contractor must follow the guidance and changes outlined above. The Contractor must all make sure that the CE Marking / Declaration of Performance and relevant product related documentation is appropriate to demonstrate and ensure compliance with the Building Regulations.

29.3.7 All products where applicable must comply with relevant Harmonised European Standards (HENs)

29.3.8 All products must be provided with a Declaration of Performance (DoP). The DoP must be provided by the manufacturers and must provide information relating to the characteristics of the product and confirm the conformity of the construction product with the declared performance. The CE mark attributed to the product must follow the DoP.

29.3.9 All technical submittals for products and equipment proposed by the Contractor must include all relevant DoP's and must in the first instance be verified by the Contractor before submitting to the Employers Representative or Engineer. The Contractor must verify that the products being proposed do comply with the DoP and are suitable for their intended use in construction works and suitable for the application intended. The Contractor must also refer to National Standards to ensure that any National minimum standards for specific intended uses of the product in Ireland are complied with. Where such verifications and a DoP has not been provided as part of the technical submittal, the submittal will be deemed invalid and will not be considered. No claims for time lost, or cost increases owing to a potential change in the products or materials shall be considered by the Engineer or Employers Representative as a result.

29.3.10 The Contractor as part of his "Ancillary Certifiers" role under Building Control Amendment Regulations (BCAR), shall maintain a record of all DoP's and shall include same as part of his Inspection Plan records and reports.

29.3.11 The manufacturer's must fully comply with their obligations under the Construction Product Regulations, and shall if requested provide any additional, or supplementary information as may be requested by the Engineer or Employers Representative as may be considered necessary. In the event of such information not being forthcoming within a timely manner the Contractors proposal shall be rejected. No claims for time lost, or cost increases owing to a potential change in the products or materials shall be considered by the Engineer or Employers Representative as a result.

29.3.12 The Contractor must ensure compliance with Building Regulations and as such, all works must be carried out using proper materials that are fit for the use for which they are intended and for the conditions in which they are to be used.

29.3.13 The Contractor shall refer to the details within the Construction Products Regulation (CPR), and all annex's therein and shall ensure that all related elements are fully satisfied

29.4 MATERIALS

29.4.1 All products, materials and equipment shall comply with the project specification, as well as referenced standards and all applicable regulatory requirements.

29.4.2 Similar items of equipment and individual materials shall be selected from one manufacturer's range to standardise appearance, maintenance, and replacement.

29.4.3 Unless otherwise indicated, standard manufacturer's finishes and colours are to be provided.

29.4.4 All materials, products and equipment are to be transported, handled, lifted, hoisted and stored in accordance with the manufacturer's guidelines to prevent damage to equipment and injury to persons.

29.4.5 The manufacturer's installation recommendations shall be followed and adhered to in full including any requirements for additional or ancillary components not explicitly specified but recommended to complete the installations ensuring suitability for purpose.

29.4.6 In accordance with Article 42 of DIRECTIVE 2014/24/EU where technical specifications in these documents are defined by reference to a specific make or source, or a particular process, or to trademarks, patents, types or a specific origin or production it shall be deemed that the reference is followed by the words "or equivalent"

29.5 CO-ORDINATION AND LIASION WITH OTHER TRADES

29.5.1 The Contractor shall be responsible for co-ordination of his works with other specialists and sub-contractors and determine all necessary builder's work and attendances by a Main Contractor.

29.5.2 The Contractor shall note that Pearse Officers Mess and it surrounds is a "live" environment with other activities and works contractors being undertaken at the same time as the proposed works. The Contractor shall be expected to develop liaison strategies and methodologies in conjunction with the various specialists and relevant departments within Pearse Officers Mess. All such strategies and proposals shall be developed and submitted as part of the Contractors RAMS submission for a "Permit to Work".

29.5.3 The Contractor shall co-ordinate space requirements with other services in accordance with routing shown on drawings and utilise space efficiently to maximise accessibility for other installations and for future access and maintenance.

29.5.4 The Contractor shall review all works requirements / project scope documentation with other sub-contractors and specialists prior to any installation. This shall include specialist supplier's information such as mechanical plant systems and installations, control systems, industrial door equipment, and any

other specialist elements being provided by other trades or to which the Contractors works are to be interfaced with.

29.5.5 The Contractor shall co-ordinate space requirements with other services in accordance with routing shown on drawings and utilise space efficiently to maximise accessibility for other installations and for future access and maintenance.

29.5.6 The Contractor shall review mechanical and electrical layouts with other Contractors prior to any installation.

29.5.7 The Contractor will make available the appropriate personnel for attendance at site co-ordination meetings.

29.5.8 The Contractor shall include for the production at an early stage of co-ordinated services layout drawings including sectional details of all primary services routes. These drawings shall be fully co-ordinated between mechanical and electrical specialists and shall be issued by the Contractor to the ER and Engineer for approval before the installation of any works proceeds.

29.5.9 The Electrical specialists shall be responsible for detailing all primary electrical services and producing specific installation details and drawings which shall be provided to the Mechanical specialists who as lead co-ordinator shall be responsible for presenting agreed co-ordinated mechanical and electrical layouts to the ER and design team.

29.5.10 Any works undertaken resulting in critical dimensions not being achieved (for example ceiling voids) or requiring alterations of architectural finishes where coordinated drawings have not been produced and agreed with the design team will be removed and reinstated to design team satisfaction at the Contractor's expense.

29.5.11 Any installations undertaken by the Contractor resulting in less than satisfactory appearance or improper works in the opinion of the Engineer where insufficient coordination has taken place shall be fully removed and rectified at the Contractors expense. (Eg. pipework crossings or in proximity to electrical distribution or Comm's equipment etc.)

29.5.12 The Contractor will make available the appropriate personnel for attendance at site co-ordination meetings, technical meetings, and project progress meetings. Technical meetings shall be scheduled to occur fortnightly to be attended by the technical representatives of the contractor and their specialist sub-contractors. Project progress meetings shall be scheduled to occur fortnightly. In advance of each Progress meeting the contractor shall be expected to have issued a detailed progress report for review by all before the scheduled meeting.

29.6 PRODUCTION OF INFORMATION – BUILDERS WORKS AND WORKING DRAWINGS

29.6.1 The Contractor shall develop Builders Works Drawings incorporating all Builders Works required to be provided on behalf of the specialists by the Contractor. The Contractor's Builders Works Drawings shall contain all necessary information including dimensional and setting out details.

29.6.2 The drawings shall include 1:20 and 1:50 sections and details clearly identifying the Contractors requirements to provide a full working installation in compliance with this specification, manufacturers guidelines and industry good practice.

29.6.3 The Contractor shall provide detailed installation and working drawings to include sections and details, room data sheets with wall elevations. All drawings shall be produced in CAD or REVIT and shall be issued to the design team for comment prior to commencement of installations.

29.6.4 The Contractors drawings shall include 1:20 and 1:50 sections, elevations and details clearly identifying the Contractors proposals and requirements to provide a full working installation in compliance with this specification, manufacturer's guidelines and industry good practice.

29.7 PRODUCTION OF INFORMATION – INTERFACING AND CONNECTIONS TO EXISTING SERVICES

29.7.1 The Contractor shall note that a permit to work system will be operated by the Defence Forces and no works to existing services may be undertaken without approval.

29.7.2 Works involving tie-in, interfacing or connections to existing services such as, power networks, IT networks, fire and security systems shall only be carried out having obtained agreement and approval to proceed.

29.7.3 In order to obtain approvals the contractor must submit in good time detailed method statements and risk assessments, fully describing the tasks to be carried out, identifying any implications for the client in terms of temporary down time etc., Method statements shall be submitted at least 10 days before works are required to commence. The contractor shall note that connections to existing may be restricted to weekend work. All required shut downs and tie ins shall be allowed for as out of hours work.

29.7.4 A schedule of Method Statements will be required and shall be developed by the Contractor at an early stage of the works.

29.8 PRODUCTION OF INFORMATION - PROCUREMENT DETAILS

29.8.1 The Contractor shall refer to individual sections of the specification and where requested, the Contractor shall provide full shop drawings and complete technical submittal documentation at an early stage to allow appropriate time for review and consideration of the information provided. The Engineer will endeavour to return comment or acceptance of proposals within 10 days of receipt of full submittals. The Contractor shall note that the programme implications of inadequate notice or late provision of information regarding submittals cannot be accepted by the Engineer.

29.8.2 The Contractor shall in advance of ordering any equipment submit a full and complete procurement schedule listing all items being procured providing the following information to the Engineer.

- Plant Item including specific Reference Name or identification
- Manufacturer / Supplier Information
- Lead time for delivery
- Expected on site delivery dates

29.8.3 On receipt of the above information the Engineer reserves the right to request further information including technical data sheets or shop drawings in order to be fully satisfied of the Contractor's intent. Mock-ups, of main supports and primary installation elements, containment etc., shall be provided by the contractor based on technical information submitted.

Samples are to be provided and erected is a "samples area" for design team comment. All samples are to be operational and connected.

29.9 PRODUCTION OF INFORMATION – DETAILED INSTALLATION DRAWINGS

29.9.1 The Contractor shall examine design layout and existing "as built" drawings indicating details where modifications to the existing systems may be required. The Contractor shall provide detailed "construction" drawings identifying "tie-in" locations, new links between devices, wiring configurations and all necessary information to fully outline the Contractors works proposals.

29.9.2 The Contractor shall provide "as installed" and fully updated record layout drawings completed to reflect any modifications or changes made to the existing systems through the course of the project. Where existing as builts are not available, the Contractor shall be expected to reflect all installations (new and existing) in a complete set of record information documents including drawings.

29.9.3 The Contractor shall include for the production at an early stage of co-ordinated services layout drawings including sectional details of all primary services routes for all proposed cable containment systems. These drawings shall be fully co-ordinated and checked against existing services along the proposed routes. All builders works' implications such as forming of opes must be clearly highlighted and submitted for approval before the installation of any works proceeds. The Contractor shall allow a period of not less than 3 weeks for review of initial drawings. The Contractor shall ensure that drawings are submitted with sufficient time for review of drawings and any necessary modification and re-review so as not to impact on proposed installation dates. The Engineer shall not be responsible for any programme delays as a result of sufficient time not being allowed.

29.9.4 The Contractor shall be responsible for providing detailed working drawings to show tie-in connections and modifications to fire detection systems, emergency lighting systems, and voice alarm systems. These drawings shall include details of cable routes and circuiting.

29.9.5 The Contractor shall be responsible for detailing all primary electrical services and producing specific installation details and drawings for all of the works within the contract and for connections to items of plant or equipment not supplied under the contract but forming part of the works.

29.9.6 Any works undertaken resulting in critical dimensions not being achieved (for example ceiling voids) or requiring alterations of architectural finishes where coordinated drawings have not been produced and agreed with the design team will be removed and reinstated to design team satisfaction at the Contractor's expense.

29.9.7 Any installations undertaken by the Contractor resulting in less than satisfactory appearance or improper works in the opinion of the Engineer where insufficient coordination has taken place shall be fully removed and rectified at the Contractors expense.

29.9.8 The Contractors drawings shall include 1:100 plan layouts and 1:50 sections, elevations and details clearly identifying the Contractors proposals and requirements to provide a full working installation in compliance with this specification, manufacturer's guidelines and industry good practice.

29.10 QUALITY CONTROL AND WORKMANSHIP

29.10.1 The Contractor shall be responsible for on-site installation quality control. As such the Contractor will implement and maintain high standards of quality control governing materials and equipment, project management, site conditions and workmanship to provide a complete working installation to the highest standards that can be reasonably expected or attained.

29.10.2 Evidence of quality control procedures being in place must be demonstrated in this regard. Details of the contractor's QA/QC procedures must be submitted to the ER and Engineer.

29.10.3 Only competent persons suitably trained with the necessary qualifications and experience appropriate to the task shall carry out installation works.

29.10.4 The Contractor shall refer to BS 8000 "Workmanship on Building Sites" and shall implement best practice in this regard.

29.10.5 In recognition of the requirement to effectively train apprentices in the trade skill, workmanship and experience and to ensure the highest standards of installations reasonably attainable, the Contractor shall ensure that a ratio of two apprentices to each qualified trade's person is not exceeded on site. Evidence will be requested to demonstrate compliance in this regard.

29.10.6 The Contractor shall execute his works in accordance with industry standards and any relevant guidelines offered by codes of practice or applicable regulations.

29.10.7 The Contractor shall establish and implement manufacturers' installation instructions and procedures in full.

29.10.8 The Engineer reserves the right to observe ongoing and completed work and comment there on, without prejudice, to the Contractor's responsibility for quality control. Defective or sub-standard installations or workmanship shall be rectified at the expense of the Contractor.

29.10.9 Prior to commencement of installations the Contractor shall present to the Engineer detailed "benchmarking details", to include sketch proposals and reference photographs to clearly illustrate the Contractors proposed installation methods and providing details of the minimum standards of installation that are to be expected. In addition, the Contractor shall be expected to construct "mocked up" sample installations fully reflective of the installation methods and proposals. These "mockups", once accepted shall be retained as "bench mark" samples on which the installations will be based. Mock-ups are required for elements such as;

- Cable Containment, Fire Alarm Cabling, Exposed Services Installations.

29.10.10 In addition to benchmarking, working samples shall be provided for elements such as general lighting, where samples are to be connected and erected in an environment reflective of the final application.

29.11 Building Control Regulations

29.11.1 The Contractor shall be responsible for ensuring full compliance with the Building Control Act 2007 and Building Control Regulations including the Building Control (Amendment) Regulations 2014.

29.11.2 The Contractor shall comply with the "Code of Practice for Inspecting and Certifying Buildings and Works" and shall co-operate with the Design Team and Assigned Certifier.

29.11.3 The Contractor shall be responsible as an "Ancillary Certifier", having design responsibility for particular aspects of the mechanical and electrical installations and as, "competent technical and trade persons that install products and/or test on completion", as such the Contractor shall participate fully and undertake all requirements as may be outlined by the Assigned Certifier

29.11.4 The Contractor shall ensure that a competent person is assigned to oversee the Construction works and to ensure that all workmanship complies with the requirements of the Building Regulations.

29.11.5 The Contractor shall ensure that all materials which they select and for which they are responsible comply with the requirements of the Building Regulations.

29.11.6 The Contractor as "Ancillary Certifier" shall liaise with the Assigned Certifier in the development and implementation of the project Inspection Plan.

29.11.7 The Contractor shall provide Compliance Certificates and any other requested documents to the Assigned Certifier for the purposes of handover and certification, or as may be requested by the Building Control Authority.

29.11.8 The Contractor shall provide all Test and Compliance Certificates to the satisfaction of the Assigned Certifier and the Engineer. These certificates must be presented in sufficient time for review prior to issue of the Certificate Completion Stage.

29.11.9 Consideration must be given to the requirement for commissioning and certification together with the preparation and submission of "Ancillary Certification" in the project programme. The Contractor must schedule and detail all requirements in his works programme for incorporation in the Main Contractors master construction programme.

29.11.10 The Contractor shall be responsible for ensuring that Certification is issued in adequate time to allow the submission of the "Certificate of Compliance on Completion", lack of awareness, or programme constraints will not be acceptable for failure to allow sufficient time for completion of "Ancillary Certifiers" requirements, where the Contractor has not adequately made provision, or has not informed the Main Contractor of the minimum necessary task durations.

29.11.11 The Contractor shall note that failure to undertake any aspects relating to Building Control will result in the non-submittal of the "Certificate of Compliance on Completion". The Contractor shall note that the building cannot be opened, used or occupied until a valid Certificate of Compliance on Completion is accepted by the Building Control Authority.

29.11.12 The Contractor shall note that the Engineer will not provide their "Ancillary Certification" if there is any outstanding works, any outstanding defects, incomplete documentation, outstanding Contractors "Ancillary Certificates", or any other relevant documents on which the Engineer would rely. On this basis the Engineer will not be responsible for delays in submitting the "Certificate of Compliance on Completion", where information is outstanding.

29.11.13 The Contractor shall note requirements for a Phased Commissioning and Handover to enable the early Handover and reuse by Defence Forces Training Centre of the existing Pearse Officers Mess. The Contractor shall provide all necessary commissioning certification and "Ancillary Certification" to enable a phased handover.

29.11.14 The Contractor shall be responsible as an "Ancillary Certifier", having design responsibility for particular aspects of the electrical installations and as, "competent technical and trade persons that install products and/or test on completion", as such the Contractor shall participate fully and undertake all requirements as may be outlined by the Assigned Certifier.

29.11.15 Ancillary Certificates of Compliance are required from the following "Specialist" contractors. The following is a non-exhaustive list;

- Lightning Protection System
- Fire Detection and Alarm System
- Emergency Lighting Systems
- Electrical Installations

29.11.16 These ancillary certificates must comply with the suite of certificates developed by RIAI, ACEI, Engineers Ireland and SCSI specifically:
Ancillary Certificate Compliance: Design (Commencement / 7 Day Notice)
Ancillary Certificate Compliance: Design (Completion)
Ancillary Certificate Compliance on Completion

29.11.17 The Contractor shall be responsible for the Design, Selection and installation of the complete support & Bracketry systems (inc plinths & proprietary support systems), for all services included in the electrical package, including anchor systems and metal framing supports etc. The Contractor shall be responsible for determining the appropriate components, materials and methods of installation based on the fully loaded capacities +50% of proposed systems / equipment and the structure from which the systems / equipment is to be mounted.

29.11.18 The Contractor shall ensure that a competent person is assigned to oversee the Construction works and to ensure that all workmanship complies with the requirements of the Building Regulations.

29.11.19 The Contractor shall ensure that all materials which they select and for which they are responsible comply with the requirements of the Building Regulations.

29.11.20 The Contractor as, "Ancillary Certifier", shall liaise with the Assigned Certifier in the development and implementation of the project Inspection Plan.

29.11.21 The Contractor shall provide Compliance Certificates and any other requested documents to the Assigned Certifier for the purposes of handover and certification, or as may be requested by the Building Control Authority.

29.11.22 The Contractor shall provide all Test and Compliance Certificates to the satisfaction of the Assigned Certifier and the Engineer. These certificates must be presented in sufficient time for review prior to issue of the Certificate Completion Stage.

29.12 FIRESTOPPING

29.12.1 All electrical services penetrating fire walls shall be fire stopped. The Contractor shall refer to Architects drawings for details of fire compartment walls and associated fire rating.

29.12.2 The Contractor shall include for the provision, installation, labelling and certification of proprietary fire stopping materials, intumescent pillows etc., within electrical distribution containment systems.

29.12.3 The Contractor shall be responsible for the provision of Fire Stopping to services Ope's, risers etc formed as part of these work. However, the Contractor shall also ensure that all Fire Stopping deficiencies identified during the course of the works are brought to the attention of the ER. Once Fire Stopping has been installed the Contractor shall not disturb or modify the firestopping to facilitate any further installation. Any modifications to fire stopping shall be correctly repaired or reinstated by the Fire Stopping specialists.

29.12.4 The Contractor shall bring to the attention of the ER any additional fire stopping requirements which may have been observed during the installation works, or where the Contractor has observed damage to installed fire stopping all such locations shall be advised for remedial action.

29.13 TESTING & INSPECTIONS

29.13.1 The Contractor shall be responsible for a carrying out all commissioning, testing and inspections as required by the specification or by any governing regulations or codes of practice not specifically referenced in the documentation.

29.13.2 The Contractor shall note the requirements to develop a complete Testing and Commissioning Plan to demonstrate the thorough and detailed commissioning of electrical systems, particularly mains distribution, fire detection and alarm systems, emergency lighting systems and any other electrical systems. The Contractor shall clearly indicate commissioning tasks associated with works at Pearse Officers Mess. The Contractor shall include all necessary allowances for phased / multiple commissioning requirements.

29.13.3 The Contractor shall maintain an accurate documented record of all commissioning and test results to include the type of test carried out, listing all observations and findings including defects and failures. The documentation shall also give details of proposed or instructed remedial actions taken to correct any defects or failures. A retest of all failures shall be documented.

29.13.4 The Contractor shall prepare a written schedule giving a minimum 14-days notice period of proposed test dates for witnessing by the Engineer, ER and Defence Forces representatives.

29.13.5 The Contractor shall provide the original Test and Compliance Certificates for inclusion in the O&M Manual. These certificates must be presented prior to Completion Stage, as failure to do so will delay completion and all costs for delays attributable will be borne by the Contractor.

29.13.6 Where required by the Specification the Contractor will be obliged to engage third party testing and commissioning specialists. The proposed third-party details together with the scope of their engagement shall be submitted to Engineer for comment or approval by the Contractor no less than one calendar month before the programmed pre-commissioning dates.

29.13.7 The Contractor shall prepare a detailed schedule and commissioning programme identifying tasks, durations and sequence together with key dates for co-ordination with the Main Contract Programme. The Contractor shall ensure that sufficient time is allocated within the Main Contract programme for successful and complete testing commissioning and witness testing. The Commissioning Programme shall be developed to indicate the separate commissioning and handover activities for the all aspects of the works at Curragh Transport Workshop.

29.14 SITE FACILITIES

29.14.1 The Contractor will provide secure covered storage facilities for all materials and equipment necessary for the proper execution of the contract. The Contractor shall allow for deliveries of materials and equipment commensurate to the space available. The Contractor shall co-ordinate site facility requirements in line with the contract documents. The Contractor shall take account of site constraints and make adequate provisions.

29.14.2 The Engineer may reject materials or equipment where it is considered that these materials are not being stored adequately and protected from damage and these will be replaced at the Contractor's own expense.

29.14.3 The Contractor shall provide site office facilities complete with telephone, and e-mail capabilities for receipt of design information. The Contractor shall also include for the provision of all CAD facilities complete with A1 colour plotting facilities. The Engineer will not be responsible for providing hard copy drawing prints and all information will be issued in electronic format for printing by the Contractor.

29.15 SITE SUPERVISION

29.15.1 The Contractor shall include for the provision of full time, on site, suitably experienced Foremen for each shift operated, who's time and responsibility will be dedicated solely to the project for the supervision of trades persons under their control. The Foreman shall not be involved in installation works as a trades person.

29.15.2 Chargehands with responsibility for separately identifiable elements of the installation shall also be provided as required.

29.15.3 The Contractor shall include for the provision of adequate supervision for the entire duration of the works. The Contractors supervisory staff shall be on site throughout the whole time of the works and at no stage shall Contractors operatives be unsupervised.

29.15.4 The Contractor shall include for the provision of a suitably experienced Contracts Manager with overall responsibility of the project. The Contracts Manager will be expected to be present on site for a minimum of 1 day per week with additional attendance coinciding with site meetings.

29.15.5 As works progress the requirement may increase to full time attendance of the Contracts Manager and allowances shall be made for same.

29.16 OPERATION AND MAINTENANCE MANUALS

29.16.1 Preparation of operating and maintenance manuals shall be based on the following documents: -

- BS EN 82079-1: 2012; Specification for Electrical Manuals
- BSRIA BG2/2004; Computer based operating and maintenance manuals – options and procurement guidance.
- BSRIA BG79/2020; Handover Information and O&M Manuals
- BSRIA Technical Note TN 12/86; Fault finding procedures in the building services industry

29.16.2 At an early stage of the contract, the Contractor shall submit a preliminary draft set of Operation and Maintenance Manuals, to the Engineer for comment.

29.16.3 The Contractor shall obtain Defence Forces preferred O&M structures and formats at an early stage, which shall form the basis of the Contractors O&M. The draft formats shall be presented to and agreed with the PSDP. Note an electronic and hard copy format O&M / Safety File is required. The electronic Safety File shall be constructed by specialists.

29.16.4 The O&M shall be developed throughout the project and shall be submitted in final draft four weeks before the date for Substantial Completion of the project, at which time it will be agreed that only information to be added to the files will relate to final commissioning and certification. The Contractor shall note that provision of O&M information is a requirement under BCAR and delayed provision of the O&M will delay BCAR.

29.16.5 After final approval from the Engineer and before making application for final payments, the Contractor shall present the following:

- 2 No. Paper Copy (Colour Print, bound in A4 Size folders, Drawings folded to suit (sizes to be agreed with Employers' Representative)
- 2 No. USB (".doc" and ".pdf" formats generally) submitted electronically in original format and as well as pdf format.

29.16.6 The Operation and Maintenance Manual shall contain the following as a minimum:

- A detailed asset management register to the Employer's template outlining element, cost, warranty period, maintenance schedules and requirements, expected meantime between failures, maintenance company, contact details, etc. and all other information pertinent to the installation;
- A list of the 'As-Built' Drawings;
- A description of the general works and of each service installation and fittings;

- A description of the method of operation of each service/installation and fittings, including the independent method of operation of each item of plant and equipment;
- Detailed procedure for starting up each of the services/installations whether individually or as a whole;
- Detailed procedure for shutting down each of the services/installations whether individually or as a whole;
- A description of the maintenance methods and routine procedures and requirements for each service/installation and fitting, including each item of plant, equipment and fitting;
- A list of manufacturers, suppliers, installers, trade names, model and/or catalogue numbers, for all items of plant, equipment and fittings including complete with ordering references and all manufacturers' names and works addresses;
- Wiring diagrams for all items of plant and equipment;
- Copies of manufacturer's literature, including operating instructions and maintenance procedures for all items of plant, equipment and fittings;
- Copies of manufacturer's detailed drawings of all items of plant, equipment and fittings;
- Health & Safety procedures and guidelines & Project Safety File;
- Fault finding procedure;
- Emergency plant failure procedure;
- A list of spares to be stocked by the Employer;
- Original copies of all test certificates, data and results arising out of testing and commissioning the Works;
- Manufactures guarantees or warranties.

29.16.7 The contractor shall provide an Electronic copy of the final and agreed O&M Manual including all technical literature and 'As Installed' drawing information etc. All text shall be presented on Microsoft Word (latest version) files or PDF. All manufacturers' literature, catalogue information etc shall be scanned and presented in PDF format. The electronic copy shall be submitted on USB format.

29.16.8 The Client shall reserve the right to engage the services of a specialist author to prepare the Operating and Maintenance manuals, should the contractor fail to provide a full set of complete comprehensive Operation and Maintenance Manuals to the satisfaction of the Client and Engineer. The cost of the specialist author shall be deducted from retention or monies outstanding.

29.17 TRAINING AND FAMILIARISATION

29.17.1 The Contractor shall provide full training and familiarisation to the Client or persons nominated by the Client. The training and familiarisation shall be provided on all aspects of the installed systems and the use of the O&M Manuals. The Contractor shall ensure the attendance of all specialist suppliers who shall describe their systems, highlighting specific relevant items of note to include, maintenance requirements and client's responsibilities.

29.17.2 The training and familiarisation shall be expected to be provided on two occasions, at times to be scheduled and agreed with the client. At least one of the occasions must be completed before Handover with a further session to be held at the request of the client and within eight weeks of occupation.

29.17.3 The Contractor shall note that the client may refuse to accept handover of the building until such time as adequate training and familiarisation has been provided. It should also be noted that final BCAR acceptance and submission of completion certification cannot proceed until training in the use of the systems has been provided.

29.18 HANDOVER

29.18.1 The Contractor shall be available for attendance at a formal handover and presentation of the O&M Manuals to the client.

29.18.2 00.19.2 As part of the familiarisation training the Contractor will be expected to demonstrate a working understanding of the installed systems to a level that can be conveyed to the client to enable him to operate the systems and installations to their full potential with confidence.

29.18.3 The Contractor shall note the following minimum requirements in order to achieve handover;

- Completed O&M's including "as built" drawings and commissioning records
- Completed system certification
- Completed Demonstrations to the Engineer
- Completed Client / Operator Training
- Completed Client Demonstrations
- Completed "snags"

29.18.4 Post-Handover and for an initial "run-in" period following occupation of no less than 2 weeks the Contractor shall maintain an on-site presence of appropriate persons to ensure the seamless transition back to full operations and shall provide an immediate response to any issues that arise.

29.18.5 Following handover, the Contractor shall attend monthly review meetings on site to deal with any arising issues and ensure identified "snag" items are being actioned.

29.19 DEFECTS LIABILITY

29.19.1 During the Maintenance period any defect developed in the Electrical Services Installations during this period shall be rectified and made good at the Contractor's own expense. Exceptions will only be made where it is evident that the cause can be seen to be outside the Contractors control.

29.19.2 The term defect in shall be interpreted as: any item of plant, equipment or component thereof, accessory or fitting that shall be found defective, show signs of mechanical or electrical weakness or undue wear in consequence of faulty design, workmanship or material'.

29.19.3 In the event of the Contractor refusing to rectify such defects within a reasonable period, the Engineers will have the works carried out by others, and any charges arising there from shall be at the expense of the Contractor and deducted from retention monies.

29.20 MAINTENANCE PERIOD

29.20.1 The Contractor shall maintain the Electrical Services Installations for a period of twelve (12 No.) calendar months commencing from the date of acceptance of the Certificate of Compliance on Completion by the Building Control Authority.

29.20.2 The Contractor shall at Handover nominate a responsible person who shall liaise directly with the building operator on all matters associated with maintenance for the duration of this period.

29.20.3 Maintenance during the 12 months maintenance period shall be all inclusive and under the contractors responsibility, shall include all statutory, planned preventative and reactive maintenance including call outs. Where necessary this shall include maintenance by specialists and or manufacturers agents, in order that all maintenance recommended by manufactures is complied with in full.

30. UTILITY CONNECTIONS AND SUPPLY

30.1 ELECTRICAL SERVICE ORIGIN OF SUPPLY

30.1.1 There is currently existing ESB duct supplies to the existing main board.

30.1.2 The Scope of Works for the project is to include the complete upgrade of Pearse Offices Mess Fire Detection and Alarm System and Emergency Lighting connected to existing electrical supplies.

30.1.3 The Contractor shall provide all that is required to ensure the newly installed systems is provided in sufficient time to meet the Contractors programmed deliverables.

30.1.4 The Contractor shall schedule a meeting with the Defence Forces estates to discuss the entire installations proposed.

30.2 TELECOMS & FIBRE CONNECTIONS

30.2.1 Incoming communications cabling shall be provided by Defence Forces Communications and Information Systems.

30.2.2 The Defence Forces will provide details of the proposed ISP. The Contractor shall be responsible for all subsequent engagement with the ISP and shall provide all that is required to ensure the appropriate connections are provided in sufficient time to meet the Contractors programmed deliverables. Note, the requirements of the project include for relay of signals from fire systems from Curragh Camp and as such the Contractor shall be responsible for all necessary to complete this. This must be demonstrated in advance of handover.

30.2.3 The Defence Forces shall provide final “active” ICT equipment for their Networks following handover.

30.2.4 The installed systems as part of this contract shall be stand-alone.

31. EXISTING SERVICES

31.1 EXISTING SERVICES - GENERAL

31.1.1 The Contractor shall be fully responsible for identifying all existing services at Pearse Officers Mess and generally across the site. The contractor shall make allowance for tracing and identifying all circuits and cables.

31.1.2 The Contractor shall be fully responsible for identifying, making safe and stripping out of all existing services at the Mess that will become redundant as a result of the new installations.

31.1.3 Where services are identified that are expected to remain post completion of works, where such services are identified as being non-compliant with the National Rules for Electrical Installations I.S.

10101:2020+AC":2025, the Contractor shall compile a report with recommendations for further consideration by the Defence Forces.

31.1.4 All cables passing through these areas shall be traced and identified to enable making good. All redundant cabling shall be stripped out back to source. For tender purposes the contractor shall allow an Electrician & apprentice for a minimum of 7 days to trace and identify all existing cabling. A schedule of cables and destinations shall be provided. The Contractor shall set out a complete method statement for all stripping out and disconnection works. The contractor is particularly advised to examine the site during the tender period and ascertain the full extent of these works. The Contractor will be required to liaise with the Defence Forces representative before commencing the strip out works.

31.1.5 The Contractor is specifically advised and shall be deemed to have surveyed the full extent of strip–out and diversions, as well as items to be disconnected / reconnected, during the Tender period and all costs are deemed included in the Tender return. No future claims in this regard will be entertained. The Contractor shall as part of their tender preparation carry out their own survey. Any discrepancies shall be advised by the Contractor and included in the tender.

31.1.6 All work shall be carried out in an environmentally aware manner in order to minimise any adverse environmental impact caused by the works.

31.1.7 The contractor shall take all due care when carrying out this project to carry out the works in an environmentally aware manner and dispose of all redundant materials in an environmentally responsible manner, including the use of recycling or specialist disposal methods to avoid the release of pollutants to the environment. Please note that useable redundant materials or valuables found during strip out works may be required to be presented to the client for review.

31.1.8 All redundant materials containing material classified under 'European Communities Waste Management Act, 1972' and 'S.I. No. 73/2000 – Waste Management (Hazardous Waste) (Amendment) Regulations, 2000' shall be considered as hazardous waste and shall be disposed of in accordance with legislative requirements. This includes fluorescent lamps, cathode ray tubes, batteries containing mercury, fire alarm detectors containing ionisation chambers (potential radiation exposure), etc.

31.1.9 The Contractor shall ensure that approved methods are strictly adhered to by the site installation team and no deviation from approved materials, or methods will be permitted.

31.1.10 In the event that the Contractor encounters an issue preventing them from proceeding with approved methods, they must stop work and must engage with the client's representative or the Engineer until a resolution is found and works can proceed.

31.1.11 The Contractor shall make provisions within his programme and allowances within his tender for elements of unforeseen works that may be required and for disruption that may be caused where resolutions require further engagement with, and the approval of the ER.

31.1.12 The Contractor shall be expected to form an opinion based on experience, during tender stage site visits and shall include any necessary costs within his tender sum. No claims shall be entertained in respect of delays, disruptions, or additional works as a result of restrictions or any other implications

Survey Photography	Notes
	Main Distribution Board F34
	Sub Distribution Board F09A
	Fire Alarm Panel G14

32. EMERGENCY LIGHTING INSTALLATIONS

32.1 OUTLINE DESCRIPTION

32.1.1 The Contractor shall be responsible for the supply, installation, commissioning, and demonstration of a complete Emergency Lighting system consisting of PERC ATS conforming to IS 3217 and IS EN 62034 Emergency luminaries and escape route signage.

32.1.2 The Contractor shall engage with a specialist Emergency Lighting system providers and co-ordinate all elements of the installation in order to provide a complete system in accordance with the intent of this specification to the satisfaction of the engineer.

32.1.3 The Contractor shall include for a complete emergency lighting installation as indicated on Defence Forces Engineering Design drawings.

32.1.4 The system has been designed and shall be installed to provide cover to all areas. The Emergency Lighting system shall incorporate the following equipment.

- Central Test Units
- Exit Signage
- Self-Contained Emergency Luminaires
- Maintained Emergency Luminaires
- Emergency Lighting Panel
- Extended Recording

32.2 STANDARDS

32.2.1 The system provided shall be installed, tested, commissioned, and certified to ensure the system and its respective components are in full compliance with, but not be limited to the following standards: -

- I.S. 3217: 2023- Irish Standard for Emergency Lighting
- I.S. EN 62034:2012 - Automatic Test Systems for Emergency Lighting
- I.S. EN 1838: 2013 - Lighting Applications – Emergency Lighting
- I.S. EN 50172: 2004 - Emergency Escape Lighting Systems
- I.S. EN 60598-2-22:2014+A1:2020 - Luminaires – Particular Requirements for Emergency Lighting
- I.S. EN 61347-2-7:2012+A1:2019 – Lamp Controlgear – Particular Requirements for Battery Supplied Electronic Controlgear for Emergency Lighting (self-contained).
- I.S. EN 61347-2-13:2014+A1:2017 – Lamp Controlgear – Particular Requirements for d.c. or a.c Supplied Electronic Controlgear for LED Modules.
- DALI Emergency Lighting Control system shall comply with EN IEC 62386-202.

32.2.2 In addition to the above installation standards, the equipment and installations shall comply with the current provisions of the following European directives:

- EMC Directive 2014/30/EU
- Low Voltage Directive 2014/35/EU

- ERP Directive 2009/125/EC
- RoHS Directive 2011/65/EU
- CENELEC

32.2.3 All electronic equipment and devices must have the CE mark of compliance.

32.2.4 All Signage must be in accordance with the European Signs Directive.

32.2.5 The complete installations shall be in strict compliance with NSAI National Rules for Electrical Installations I.S. 10101:2020+AC2:2025.

32.3 EQUIPMENT

32.3.1 Central Test Unit:

A central Test Unit shall be provided within each local distribution centre. The central test unit shall be capable of carrying out the following tests as per I.S.3217:2023 that are applicable to the emergency lighting system specified:

a) Functional test (typically 20s) but not exceeding 10% of rated duration (ATS only)

b) Functional test of 30min and 10min for 3 h respectively (all facilities except ATS)

c) Full duration test for 3h systems (all test facilities)

For this installation, ATS, para a) and b) above are applicable.

32.4 CONVERSION KITS:

32.4.1 Emergency lighting conversion kits shall not form part of this contract.

32.5 SELF-CONTAINED EMERGENCY LUMINARIES: (AS SCHEDULE)

32.5.1 Self-contained emergency luminaries must be designed and constructed in accordance with I.S. EN 60598-2-22:2014+A1:2020.

32.5.2 Photometric data shall be provided by the manufacturer in accordance with I.S. EN 13032-3.

32.5.3 All luminaries to be of flame-retardant construction and diffusers shall be glow wire tested to 850°C and shall be suitable for use on defined escape routes.

32.5.4 All self-contained luminaries shall be complete with integral automatic self-test modules, to provide fault diagnostics indicating lamp, battery, and charger/inverter failure. The luminaire shall operate in self -test mode and be capable of connection with a central Dali system.

32.5.5 Verified performance data for each emergency luminaire type must be provided by the contractor in advance of orders being placed.

32.5.6 In the event that the contractor wishes to propose an alternative to the specified luminaire the contractor must underwrite the alternative and ensure that the proposed luminaire satisfies this specification and all other applicable standards.

32.5.7 All Emergency Luminaires shall provide for ease of maintenance, with easy access to batteries, retainers on covers, retainers on screws and clip-in batteries. Luminaires with remote battery packs (“sausage packs” etc), shall not be acceptable.

32.5.8 All self-contained luminaires shall have batteries rated for a minimum 10 years of normal operation (based on 1 year aging test at 70°C ambient temperature) and shall be replaced when the luminaire no longer meets the required duration.

32.5.9 All self-contained luminaires shall be manufacturer warrantied for a minimum 10years. The warranty is to commence of the date of handover.

32.6 EXIT SIGNAGE (AS SCHEDULE):

32.6.1 Exit Sign Legends as indicated on the drawings are representative of position only. Directional arrows indications as indicated may not necessarily be directed in the appropriate direction of escape.

32.6.2 The contractor shall consult the engineer and shall allow for ad-hoc repositioning or replacements of exit sign legends as requested prior to handover.

32.6.3 All legends shall comply with European signs directive. All escape route signs shall be Type 1, as per Annex B of I.S. 3217:2023.

32.6.4 All Type 1 signs shall comply with ISO 7010: 2012+A5: 2015.

32.6.5 Exit signs shall be sized for a maximum viewing distance of 26m and shall be positioned between 2.1m and 2.5m to the base of the sign. The Contractor shall include for the provision of “supplementary” exit signage to ensure that all exit routes are clearly and unambiguously identified.

32.6.6 The Contractor shall provide supplementary (non-illuminated) exit signage as per Type 1 legends with signs to be fitted at intermittent levels in stairwells. Signs shall be positioned within 2m of an emergency luminaire.

32.7 APPROVED VENDORS & MANUFACTURES

32.7.1 The system provided shall be tested, commissioned, and certified by a registered Emergency Lighting Contractor.

32.7.2 All Emergency luminaires and system components shall be manufacturer warranted for a minimum of 10 years. A project specific warranty shall be provided the client to commence on the date of handover. (not the date of supply to site). The warranty shall include all components including batteries, which shall be warranted for at least 10 years.

32.8 TESTING & COMMISSIONING

32.8.1 On completion of system installation full testing and commissioning is to be carried out in line with manufacturers guidelines and as defined under I.S. 3217:2023.

32.8.2 The entire emergency lighting installation must be tested, commissioned and certified by a third party, independent to the installing electrical contractor. The contractor shall allow for out of hours (after dark) testing. Once satisfied the contractor shall offer the system for demonstration to the engineer and shall also allow for out of hours attendances.

32.8.3 The contractor shall ensure that the installed luminaires are fully charged for a period of not less than 72 hours before testing is undertaken.

32.8.4 The contractor shall ensure that all test instruments (lux meters etc,.) are fully calibrated with calibration certification details to be included within test record documentation. The calibration certificates must be dated within a period not to exceed six months before the commencement of the commissioning stage.

32.8.5 The Contractor shall ensure that sufficient time within the commissioning programme for the correct and thorough testing of the Emergency Lighting system in order for completion certification and all other commissioning information to be provided to satisfy handover requirements.

32.8.6 The illuminance levels identified within the standards are the minimum expected levels and are representative of the levels required to be maintained as the system ages and therefore higher levels would be expected at commissioning.

32.9 DOCUMENTATION

32.9.1 The Contractor shall provide a complete and detailed Technical Submittal which shall provide details of all elements of the proposed systems and components to include proof of compliance with relevant standards.

32.9.2 In submitting proposals the Contractor will be deemed to have verified the compatibility of all components and to have fully co-ordinated all elements between the Emergency Lighting Specialists. The Engineer will not be responsible for verification of compatibility of component elements of the Contractors proposals.

32.9.3 At practical completion stage the contractor shall provide a four-part certificate of completion in accordance with I.S. 3217:2023. The certificate shall be presented signed by relevant parties to the engineer.

32.9.4 Upon project completion the contractor shall provide complete Operation and Maintenance instructions with as the 'As installed' drawings.

32.9.5 Proof of third-party product compliance testing to I.S. EN 60598-2-22 must be provided for each emergency luminaire type and shall be included in operation and maintenance manuals.

32.9.6 The Contractor and Emergency Lighting Specialist shall note the requirements under the Building Control (Amendment) Regulations 2014.The Contractor and Emergency Lighting specialists shall be responsible as "Ancillary Certifiers" as, "competent technical and trade persons that install products and/or test on completion", as such the Contractor shall participate fully and undertake all requirements as may be outlined by the Assigned Certifier. An Ancillary Certificate shall be provided by the Contractor and Emergency Lighting Specialist.

32.10 SAMPLES

32.10.1 In advance of orders being placed or the installation of any items of equipment, the contractor shall provide samples to be displayed on site for review, comment, or approval.

32.10.2 All samples shall be checked by the Contractor for compatibility with an ATS and shall be erected and connected as working samples. Samples shall be complete with technical data literature to clearly

demonstrate compliance with relevant standards and technical performance. Details of the manufacturer's warranty shall also be presented with the samples.

32.10.3 Samples shall be reviewed under the following criteria;

- Compliance with standards
- Technical Performance
- Ease of Maintenance
- Durability
- Energy Efficiency

32.11 TRAINING

32.11.1 In addition to attendances and brief system training at a client handover the contractor shall include for the provision of the training shall consist of system operation including instruction on the procedures for carrying out and logging the emergency lighting testing. The training shall demonstrate clearly to the client on their obligations under the IS3217 Standards for Emergency Lighting.

32.11.2 The contractor shall include for the provision of formal training of client staff in the operation and use of systems. The training shall consist of detailed system operation including instruction on the procedures for carrying out and logging the emergency lighting testing as well as production of reports. As well as use of the systems, the training shall demonstrate clearly to the client their obligations under the I.S. 3217 Standards for Emergency Lighting, as well as all other relevant information for the maintenance and management of the systems and their components.

32.12 WITNESS TESTING

32.12.1 Following completion of the Contractors own testing and commissioning of the system; the Contractor shall invite the Engineer to witness test the completed installations. The Contractor shall include periods of witness testing on the works programme and shall provide at least 2 weeks advanced notice to the Engineer for scheduled tests.

32.12.2 Tests shall only be offered to the Engineer once the Contractor is completely satisfied that all commissioning has been completed to their satisfaction and all "soak" periods have been allowed.

32.12.3 Witness testing shall include operational testing of the systems to be demonstrated by the Contractor with attendance by the Emergency lighting specialists.

32.12.4 The Contractors witness testing to the Engineer of the completed system shall be expected to include random operations, staged failures of the general lighting, initiated functional tests, initiated duration tests. Tests shall be conducted after dark or at a time where the full performance of the system can be viewed. The Contractor shall provide all attendances, test instruments and tools to enable all reasonable tests to be performed. In the event of any failures being observed during witness testing, the Engineer shall reserve the right to cancel the test and the Contractor will be expected to reschedule the test following remedial actions followed by the Contractors own testing

32.13 HANDOVER DEMONSTRATION

32.13.1 In addition to formal training and witness testing, the Contractor shall provide and brief system overview training at a client handover demonstration.

32.13.2 The handover demonstration shall be conducted after dark or at a time where the full performance of the system can be viewed. The Contractor shall provide all attendances, test instruments and tools to enable all elements of the system to be demonstrated to the client.

32.13.3 Demonstration tests shall be expected to follow similar format to witness testing.

32.13.4 In addition, the contractor shall include for the provision of formal handover information and training of staff in the operation and use of systems. The training shall consist of the operation of the installed systems and use of the Operation and Maintenance Manuals.

32.13.5 Upon satisfactory completion of all formal training, the handover demonstration and handover of the O&M information and Certification the Contractor may apply for Handover of the system

32.14 ADDITIONAL LUMINAIRES

32.14.1 In addition to emergency lighting luminaires and escape route signs indicated on drawings the Contractor shall include within their tender for 10 No. luminaires, to be installed in locations requiring additional illumination such as first aid points, assembly points, and other locations where increased levels of illumination are required but that are not currently determined for indication on drawings.

32.14.2 The allowance shall be deemed to include the luminaire, wiring, installation, testing and commissioning.

32.14.3 The Contractor shall include within their tender for 10 No. non-illuminated “supplementary” escape route signs, to be installed in locations requiring additional directional indication. Signs shall be mounted within 2m of an emergency luminaire.

33. FIRE DETECTION AND ALARM SYSTEM

33.1 OUTLINE DESCRIPTION

33.1.1 The Contractor shall be responsible for the supply, installation, commissioning and demonstration of a complete Fire Detection system consisting of monitoring and detection equipment, audible alarms and control equipment necessary to detect and annunciate a fire condition. The scope shall include the provision of a complete new system throughout Pearse Officers Mess.

33.1.2 The Fire Alarm system shall provide a hard-wired interface and alert to the Curragh Barracks. The Contractor shall engage OEM approved Fire Alarm Systems Specialists and co-ordinate all elements of the installation in order to provide a complete system in accordance with the specification to the satisfaction of the Engineer.

33.1.3 The Contractor shall include for a complete Fire Detection and Alarm system installation as indicated on Defence Forces Design drawings.

33.1.4 The fire alarm system has been designed and shall be installed to provide **L1 life cover** with all areas of potential fire risk being protected. The fire alarm system shall incorporate analogue addressable control panels, repeater panels and shall utilize programmable smoke/heat detectors, programmable multi-

detectors, manual call points, input/output units and electronic sounders as indicated on the drawings. The system shall also incorporate fire alarm xenon strobe indicators for visual indication.

33.1.5 The entire fire alarm installation including detection loops and sounder loops shall be wired in PH120 **enhanced fire retardant cabling**. This refers to all new cabling installed as part of these works under IS3218:2024 standards.

33.1.6 The Contractor shall review the scheme design with Fire Alarm specialists and shall include all allowances as may be deemed necessary to complete the installations to the scheme design intent.

33.1.7 Certification of works shall be to L1 level of coverage and to IS3218:2024, noting that the works are a "New Installation". All works shall comply fully with IS3218:2024.

33.1.8 The Contractor shall note that testing and commissioning shall be deemed to include, cable testing, 100% device testing using appropriate tools and test instruments, verification of device labels, verification of correct cause and effect actions, verification of correct position / locations of devices on "as built" drawings and on the Fire Alarm Graphics. Records of all verifications and test logs shall be provided at Witness Testing stage.

33.2 STANDARDS

33.2.1 The system provided is to be installed, tested, commissioned and certified to ensure the system and its respective components are in full compliance with, but not limited to the following standards: -

- IS 3218:2024: Irish Standard for Fire Detection & Alarm Systems for Buildings – System Planning, Design, Installation, Commissioning, Servicing and Maintenance.
- In addition to the IS3218, the equipment and installations shall comply with the current provisions of the following standards.

33.2.2 IS EN 54

- part 2 Control & Indicating Equipment,
- part 4 Power Supplies,
- part 5, 6 & 8 Heat Sensitive Sensors,
- part 7 Smoke Sensors,
- part 11 Manual Call Points,
- part 12 Optical Light Beam Detectors, and
- part 13 Compatibility assessment of system components.

33.2.3 EUROPEAN UNION (EU)

- EMC Directive 2014/30/EU,
- Electromagnetic Compatibility Requirements, and
- CENELEC.

The system installation shall be in accordance with current NSAI I.S. 10101:2020+AC2:2025 National Rules for Electrical Installations.

33.3 EQUIPMENT

33.3.1 CONTROL PANELS

Fire Alarm control panels shall be EN-54 Parts 2,4 and 13 approved, microprocessor controlled analogue addressable type, of Modular system format and panel assembly. The panels shall be as per **Advanced Electronics** and compatible with a future campus fire alarm fault tolerant Fire Alarm Network.

The control panels shall be configured as appropriate for the building. The control panels shall be networked and shall be seamlessly integrated to form the basis of a campus fire network.

Fire Detection system shall display information to give a distinct audible and visual indication on a graphical screen.

The display shall permit the user to call up direct information on the following conditions.

- Fires,
- Pre-Alarms,
- Faults,
- Disablements, and
- System Site Specific Menu Shortcut functions to indicate status.

In addition the panel must provide the following functions and information;

33.3.1.1 The panel shall be capable of detecting and indicating changes in detector sensitivity

33.3.1.2 Visual and audible indicators for 'FIRE' 'PRE-WARNING' and 'FAULT'.

33.3.1.3 LCD display indicating loop number, device number, zone number and minimum of 32 alpha numeric characters for indicating location.

33.3.1.4 The panels shall be complete with integral printers.

33.3.1.5 Push Button control facilities for alarm silence, system re-set and evacuate via authorised access code.

33.3.1.6 A facility to enable testing of sounders without activating any fire alarm interfaces shall be provided on the main panel via authorised access code.

33.3.1.7

33.3.1.8 The panel shall provide a dial out fault and event monitoring to a third-party monitoring station. This may be achieved via a dedicated digital dialler or via an open channel on a digital dialler provided for the intruder alarm system. The Fire Alarm system must not share communication channels with any other systems.

33.3.1.9 The panel shall be suitable for flush mounting and shall be supplied complete with recessing bezels.

33.3.1.10 Panel colours shall be any standard BS or RAL colour the exact details of which shall be advised later. The Contractor shall include for application of alternative finishes as may be required.

33.3.1.11 The fire alarm panel is to be complete with separate din rail mounted connection terminals for field wiring. Field wiring is not to be directly connected to PCB's within the panel.

33.3.1.12 The control panel shall be capable of detecting and indicating changes in detector sensitivity, and shall incorporate Intelligent drift compensation.

The Control panel shall maintain an Integral event log to record at least the last 1000 events, with an additional 250 Fire specific log events and 250 disablement log events. The event log shall provide details on Fire and fault events as well as pre-alarm condition status of the detectors.

The control panel shall be of modular design to enable easy expansion and modification. Panels located in electrical or plantrooms shall be suitable for surface mounting with repeater panels and panels located within reception or front of house areas to be suitable for flush mounting and shall be supplied complete with recessing bezels.

The fire alarm control panels shall be provided with standby batteries back up in the event of mains power failure to provide a minimum of 72 hours of quiescent detection and a further 30 minute of full load alarms at the end of this quiescent period. The batteries shall be integral with the panels.

The Fire Alarm specialist shall provide battery sizing calculations demonstrating compliance with the above requirement as part of the technical submittal.

33.3.2 REPEATER CONTROL PANELS:

Repeater panels shall be full function type Firemans Control panels, where all functions of the main fire alarm control panel can be performed.

The repeater panel shall be suitable for integration onto the “fault tolerant” network and shall be designed so they can be seamlessly integrated as part a fire strategy network.

33.3.3 MANUAL CALL POINTS:

Manual Call Points shall be EN 54 compliant and shall incorporate dual line isolator functionality.

Manual Call Point (Breakglass units) shall be suitable for both surface or semi-flush mounting and are to be supplied complete with plastic box, test probe and a glass with plastic film covering. All fire alarm call points shall be individually addressed and shall contain an integral LED to signify the operational mode. Manual Call Points shall be coloured red and shall be positioned to comply with IS 3218:2024. Unless otherwise indicated, call point units shall be mounted at 1100mm AFFL. Devices requiring replacement glass shall not be acceptable. Manual Call Points located local to large industrial door access points shall be weatherproof type.

33.3.4 SOUNDERS:

Sounders where indicated as being integral to the smoke / heat detector unit, shall be contained either within the detector base or within the detector head. The specialist contractor shall be responsible for undertaking field trials when locating the integral sounders to ensure that the minimum sound levels of 65 dB (A) or 5dB (A) above background noise is maintained. Electronic Sounders c/w adjustable volume control with a maximum sound level of (85 dB), at 1metre shall be provided.

Where audible alarms are installed in buildings of residential (institutional), or residential (other), then the minimum sound level shall be 75 dB(A). The device should be located within the bedroom.
In public and high risk / high background noise areas addressable Electronic Sounders c/w adjustable volume control with a maximum sound level of (100 dB), at 1metre are shall be provided. These electronic sounders shall be Red in colour and shall be complete with integral RED LED flasher units.
Unless otherwise indicated, sounder and strobe units shall be mounted at 2,200mm above finished floor level.
Electronic visual indication devices shall be EN54 compliant and shall be provided to all public areas and areas of high background noise. Electronic visual indicators shall be Red in colour and shall be complete with integral LED flasher units. Unless otherwise indicated, strobe units shall be mounted at 2,200mm above finished floor level and not within 150mm of the ceiling.

33.3.5 SMOKE AND HEAT DETECTORS:

Smoke and Heat detection devices EN54 compliant and shall be complete with a common base suitable for mounting onto a besa box. The detection devices shall have integral line isolators. The devices shall also incorporate an LED to indicate the condition of the device. Detection devices shall provide information to the control panel in the form of an analogue output for processing and interpretation.
All multisensory detectors shall incorporate a minimum of five programmable states and shall be programmable via the control panel, to adjust sensitivity and response mode of individual detectors.
The configuration of heat detection and optical detection elements shall be configurable from the control panel and may include time related functions. All detectors shall incorporate 'drift compensation' to interpret the environment in which the detector is installed, thus reducing unwanted alarms. Detectors shall be able to differentiate between false alarm contamination (dust, steam etc.) and smoke conditions, using dual wavelength technology.
Detection devices have been selected on the basis of suitability for the application. Where multistate sensors are selected, it shall be the responsibility of the fire alarm system specialist to determine the most appropriate state programmed for the installed environment.
All concealed detectors such those within service voids, and ceiling voids shall have remote LED status indicators. The LED indicators shall be recessed and finished flush at approximately 2,200mm AFFL, in a serviceable location. The LED indicator shall be engraved with the location (address) of the detector served below the respective LED.
All detectors shall be as **Apollo Discovery range**, with Optical detection devices to be used in all areas except where there may be a perceived risk of false alarm and in such case Discovery Multisensor devices shall be selected. There is potential risk of false alarm in the kitchen areas from cooking fumes. Multisensors in this space shall be configured to minimize the risk of false alarms.

33.3.6 APPROVED MANUFACTURERS AND VENDORS

33.3.6.1 The Contractor shall employ a specialist Fire Systems Vendor who can demonstrate "competence" for supply, commissioning and certification in accordance with IS 3218:2024.

33.3.6.2 The System components including detection devices shall be selected from the manufacturer's specific range for compatibility with the specified control panel and operating protocol.

33.3.6.3 The System control panel components shall be as **Advanced Electronics** or equal and approved.

33.3.6.4 The System components shall be selected from the following manufacturers, or equal and approved.

- Detectors- **Apollo Fire Systems (Discovery Range)** or equal and approved.
- Air Sampling – **Xtralis, Vesda E VEU** or equal and approved.

33.3.6.5 The fire alarm system software and firmware shall be upgradeable and capable of being programmed by other fire alarm specialists at a later date, without operatives having to refer to the original supplier. A copy of the system software, including all associated engineers' codes and passwords shall be provided as part of the handover information.

33.3.7 INSTALLATION – CABLING AND WIREWAYS

33.3.7.1 The entire Fire Alarm System including detection and annunciation circuits as well as interfaces to any third-party systems shall be wired in Enhanced fire resistant cabling to minimum PH120 classification as tested in accordance with I.S EN 50200.

33.3.7.2 All cabling and Installations must be carried out in strict accordance with IS3218:2024. The Contractor shall carefully review all sections of IS3218 and shall ensure all cableways are in strict accordance with the requirements of the standards.

33.3.7.3 All cabling shall be Low Smoke Zero Halogen type throughout.

33.3.7.4 The Fire Alarm System shall be a two-wire system with detection loops wired in a cable size not less than 1.5 sq.mm PH120 Enhanced flexible fire-retardant cable with LSF sheathing.

33.3.7.5 Fire Alarm network cables (power supply) shall be wired in not less than 2.5 sq.mm PH120 Enhanced flexible fire-retardant cable. Network communications cabling shall be installed on diverse routes with minimum separation of 2m. Network cables shall be clearly labelled at 2m intervals and where they pass through walls to indicate that they are Fire Alarm Network cables.

33.3.7.6 All cables must be continuous in their length with no jointing permitted. The contractor shall consult the Fire Alarm system specialists in determining the preferred cable selection, thus ensuring maximum system performance and appropriateness for speed of data transmission.

33.3.7.7 The Contractor shall be responsible for determining the C.S.A. of all conductors required whilst taking into consideration circuit loading, length, volt drop and installation methods. The Contractor shall be responsible for determining the cable tray required to accomplish this requirement, depending on his preferred cable route.

33.3.7.8 In all areas where the cabling installation is not at risk of mechanical damage, the cable shall be clipped direct to the structure of the building using metal clips only. The spacing between clips shall be a maximum of 400mm, or as may be recommended by the cable manufacturers, whichever is less.

33.3.7.9 The Contractor shall present "benchmark" installation details for all proposed fire alarm device installations and cabling installation methods, demonstrating how the contractor intends to achieve high standards of workmanship, providing no stress or excessive bends on cables, how the installation shall provide strain relief on cables connected to devices etc.

33.3.7.10 An Insulation resistance test shall be carried out on all fire alarm cabling to a minimum of 500Vdc.

33.3.7.11 The Contractor shall agree locations of all I/O devices and where feasible shall locate I/O's in centralised locations with easy access for maintenance. Connections from the I/O's to the third-party equipment shall also be in fire retardant cabling and shall be labelled accordingly. I/O's shall not be positioned in inaccessible locations.

33.3.7.12 In all "visible" areas other than plant spaces all fire alarm cabling shall be concealed in conduit drops recessed into walls or ceilings. In all plant and service areas and where exposed the fire system cabling shall be fully mechanically protected by enclosing in galvanised steel conduit and trunking.

33.3.7.13 The system shall be installed such that it can be rewired without the need to chase walls or remove building elements. Fire alarm system cabling shall not be inverted or fixed to the underside of cable tray systems. "Tie wraps" or other non-metal fixings or supports shall not be used on any part of the fire alarm cabling installation. Provision of metal tie wraps to inverted cables or cables that rise vertically on cable trays or other supports. These metal ties may be permitted to supplement existing plastic tie wraps however metal ties shall be provided at 1metre spacing's.

33.3.7.14 All cabling associated with the fire alarm installations shall be solely dedicated to the fire alarm system and shall be run in dedicated containment systems separate from all other services. A free air spacing of 300mm shall be maintained between the fire alarm system cabling and cabling for any other service other than ELV.

33.3.7.15 All cable containment carrying Fire Detection and Alarm system cabling shall be suitably supported and fixed using metal anchors designed to remain in-situ during a fire. Plastic plugs and screws shall not be permitted. The contractor shall be expected to present proposals as part of his design selections of anchors and supports.

33.3.7.16 Upon completion of new installations, the existing wiring and redundant devices shall be completely removed and disposed. This shall include wiring and devices within accessible ceiling voids. Existing surfaces shall be completely made good including all builders works.

33.3.8 CAUSE AND EFFECT STRATEGIES

33.3.8.1 In advance of system software being configured all cause and effect scenarios shall be developed by the Fire Alarm specialist and shall presented to the Engineer for submission to the Fire Consultant and Client.

33.3.8.2 The Contractor shall allow for the complete execution of the cause and effect programme for each evacuation zone and to ensure that the Cause and Effect programme is fully validated and uses common principles used elsewhere on the campus for all evacuation zones.

33.3.8.3 The Contractor shall provide a complete working test kit to include a programme simulator to fully validate and demonstrate the cause and effect strategy in a test environment before being downloaded to the Fire System.

33.3.8.4 The Contractor shall allow for the liaison between fire alarm specialists and other third-party specialists and shall be responsible for ensuring that all elements are interfaced with the fire alarm system to achieve the Cause and Effect (C&E) strategy. The Contractor shall ensure that all third-party systems are connected and fully tested in order that the C&E strategy can be verified and witnessed as operational before being offered to the engineer for witness testing. Examples include, AOV's, smoke damper systems, door systems, gas detection systems, HVAC systems, etc. Note the fire alarm system will NOT be accepted without a fully operational and demonstrated C&E strategy.

33.3.8.5 The contractor shall be responsible for, wiring and electrical connections of third-party control panels and devices, e.g. smoke damper systems, automatic opening vent systems. The contractor shall note that the fire alarm system will not be deemed complete or accepted until all third-party elements connected to the fire alarm system are completed and connected.

33.3.8.6 Following the Contractors testing and review of the proposed C&E matrix, the Contractor shall organise a C&E workshop to be attended by the fire alarm specialist and the Engineer. The workshop shall review all issues arising from contractors testing and review contractor's proposals for implementation of the new C&E strategy.

33.3.9 TESTING & COMMISSIONING

33.3.9.1 The Contractor shall include for the testing commissioning and certification of the complete installations in full accordance with IS 3218:2024 and NSAI I.S. 10101:2020+AC2:2025 National Rules for Electrical Installations.

33.3.9.2 The Contractor shall include for witness testing and demonstration of the system functions to the Engineer.

33.3.9.3 The Contractor shall provide full commissioning data sheets and test records for all devices, including the provision of measured sound levels demonstrating compliance with the regulations. This information shall be submitted to the Engineer at least two days before the offered date for witness testing of the system. Calibration certificates for test instruments shall be provided with all test records.

33.3.9.4 The Contractor shall record sound level test measures and indicate locations and achieved sound levels on record drawings.

33.3.9.5 The Contractor shall provide a log of all "events" and a log of all "pre alarms" conditions in advance of commencement of any works and in advance of system demonstrations.

33.3.9.6 The Contractor shall ensure that adequate and sufficient time is allocated within the commissioning programme for the correct and thorough testing of the Fire Alarm systems in order for Completion Certification and all other commissioning information to be provided. The Contractor shall allow for his own testing and verification to be followed by witness testing by the Engineer and final "live" demonstration to the Defence Forces.

33.3.9.7 The Contractor shall include for all attendances during witness testing and client demonstrations to include as a minimum, fire alarm specialists, graphics operator, etc., The Contractor shall also include for all testing and communication equipment required to undertake and verify tests.

33.3.9.8 Handover of the system shall not be offered by the Contractor until all commissioning is completed and all dust caps have been removed. Once dust caps have been removed no works involving the generation of dust or dirt that may contaminate devices can be permitted on site. Should incidental once off elements of works that may generate dust be necessary the Contractor must follow all recommended procedures in accordance with IS3218 to include all logging procedures to ensure that the devices are not at risk of contamination or generating false alarms. All such works must be co-ordinated with the Fire Alarm Specialists and confirmation must be provided following works that there has been no contamination of devices and that the system has been fully restored and also that the system log updated. Following Handover of the Fire Alarm system the Contractor shall note that a Permit to Work system will be implemented by the Client.

33.3.10 WITNESS TESTING

Without prejudice to the Contractors own responsibilities for witness testing and verification, the Contractor shall advise the Engineer of a testing schedule and invite the Engineer to Observe ongoing tests and to witness between 15% and 20% of the testing of all devices. The Engineer shall require 10 days' notice to attend.

33.3.11 LABELLING

The contractor shall provide adhesive labels to each device on the fire alarm system clearly indicating the Node reference device and loop numbers. Colour coded circular adhesive labels shall be provided to each device to correspond with the various zones and shall correspond to the Contractors "as built" drawings.

Principle components, and power supplies shall be provided with engraved traffolyte labels.

Cable ways shall be provided with engraved traffolyte labels stating, "Life Safety Systems", with labels to be provided at regular intervals circa 3m, either side of wall intersections, and near junctions.

33.3.12 DOCUMENTATION

In advance of the commencement of any works related to the fire alarm installations, the Contractor shall submit a detailed Technical Submittal to the Engineer, providing full details of the proposed fire alarm system and all related components, including product information on panel components, detection devices and the system cabling. The technical submittal shall demonstrate compliance with the specification requirements. The Contractor shall allow a 10 day review period by the Engineer of all technical submittals.

The technical submittal shall include Declarations of Performance and Notified Body Certification for all products and materials proposed for use on this project.

The Contractor shall be responsible for incorporating minor changes on drawings as may be agreed on site during technical workshops. Drawing revisions shall be issued to the Engineer for comment or approval.

At Completion stage and as part of Completion Certification documentation to be submitted to the Assigned Certifier, the contractor shall provide a five part certificate of completion in accordance with IS3218:2024 (Figures B.1, B.2, B.3, B.4, F.1 and F.2). Under this Contract the Contractor shall be deemed to be the "Handover" company and shall provide the Fire Alarm System Certificate of Handover as per Figure B.4 of IS3218:2024.

The Contractor should note minimum periods for Ancillary and Assigned Certifier review of completion stage information shall be not less than five days and shall note that acceptance of the Completion Certificate is required before handover of the building is permitted.

Full maintenance manuals including as installed drawings and original design, installation and commissioning certificates (signed by all relevant parties) shall be submitted to the Engineers at the Completion stage. Dedicated "As Installed" fire alarm system drawings shall include all devices and shall denote all devices with addresses and loop numbers.

The Contractor shall provide laminated copies of the "as installed" fire alarm system drawings which shall be clearly legible and indicate the device location and device details including device number, loop number and device type. These drawings shall use colour coding for evacuation zones or compartments and shall follow the same colour coding as labels used on devices. A fully Legible copy of all drawings shall be contained within a documents holder section located at the main fire panel locations.

33.3.13 DEMONSTRATION AND TRAINING

In advance of project handover, the completed Fire Detection and Alarm system must be offered to the Engineer for demonstration testing, at which point the Contractor must demonstrate that the system is complete, cause and effect has been programmed and has been verified by the Contractor to comply with the agreed Fire Alarm Cause and Effect Strategy. All device labelling and "as built" information together with system certification must be completed before the system is offered to the Engineer for demonstration testing.

Should failures be noted during the demonstration testing the Engineer will reserve the right to cancel the test. The test shall not be rescheduled until remedial actions have been undertaken and confirmations have been received that the Contractor has fully checked and tested the complete C&E. Once the Contractor has demonstrated the system to the Engineer it shall be offered by the Contractor for Client demonstration and training.

Client demonstrations shall be expected to include a 100% demonstration of the C&E strategy and random testing of devices.

The Contractor shall ensure that all necessary tools (testing and measurement), are available to carry out any test during the demonstrations.

The Contractor shall ensure that adequate time is allowed within the commissioning programme for all demonstration testing and client handover demonstrations.

The Contractor shall allow for the complete system demonstration with system familiarisation training to the Client at a Client handover stage. The demonstration shall review all elements as per IS3218:2024 figure B.4 Confirmation of Acceptance. The Contractor shall be deemed to be the "handover company" as noted in the standard. All information referenced in figure B.4 must be in place and demonstrated before Handover of the System.

The contractor shall provide 2 hours training on each of three sessions at times to be agreed with the client. The training is to include basic system operations and procedures including use of the log book. The training shall also include informing the client of his obligations under the IS3218 Standard for Fire Detection and Alarm Systems. The contractor will allow training to be given to personnel nominated by the client at a time to be agreed with the client.

33.3.14 Samples

Following the review of the technical submittal the Contractor shall be provide samples of all proposed devices and finishes options, including the control panels. Samples of the proposed system cabling shall be provided for approval. Costs for provisions of samples are deemed to be included.

33.3.15 Extra Materials

At practical completion and in addition to handover documentation the following spare parts and items of equipment shall be provided for use by the client.

12 No. spare detectors, 4No spare sounders and manual call points of each type used on the project. These spares shall be retained on site and used during the maintenance period where replacement is required owing to non-warranty related reasons.

In addition to devices indicated on drawings the Contractor shall include within their tender for 4 No. smoke detectors c/w remote indicators to be installed in locations requiring additional detection that may not be apparent until mechanical services and other elements that may cause obstruction within ceiling voids has been installed.

34. LV DISTRIBUTION INSTALLATIONS

34.1 OUTLINE DESCRIPTION

34.1.1 The Contractor shall be responsible for the supply and installation of all Low Voltage distribution installations and cable networks installations in relation to the new Fire Detection and Alarm System, the new Emergency Lighting and any LV/cabling associated with fire compartmentation works to ensure a complete working installation.

34.1.2 From the Main LV Switchboard cabling will be distributed downstream to the Sub Distribution Boards and Motor Control Centre panels as indicated on Defence Forces layouts.

34.1.3 All cables used on this project including sub-mains LV general power and Extra Low Voltage (ELV) fire, systems cabling shall be Low Smoke Zero Halogen (LSZH) to BS 6724:2016. No PVC sheathed cables shall be permitted.

34.1.4 The contractor shall refer to specific specifications or to drawings for details on approved or specified cable types and sizes.

34.1.5 All Power and control cables must comply with the Construction Products Regulations and with I.S. EN 50575:2014+A1:2016 and I.S. 10101:2020+AC2:2025 requirements. All power and control cables must bear the Euro class standard (Minimum Class Dca, s2, d2, a2).

34.1.6 All cables must be tested in accordance with I.S. EN 61034-2:2005+A2:2020 and the smoke generated shall result in transmittance values of not less than 60% as outlined in NSAI I.S. 10101:2020+AC2:2025 Wiring Regulations.

34.1.7 For all cable types proposed for use evidence shall be provided to include.

- CE marking,
- Declarations of Performance (DoP),
- Confirmation of the Euroclass, and
- Confirmation of Smoke Emissions Generated.

34.1.8 The following refers to cable installations not specifically mentioned in other sections of the specification but are indicated on Defence Forces drawings.

34.2 SUB – MAINS CABLE INSTALLATIONS

34.2.1 All cables used on this project including sub-mains LV general power and ELV fire systems cabling shall be Low Smoke Zero Halogen (LSZH) to BS 6724:2016 and BS 5467:2016. No PVC sheathed cables shall be permitted.

34.2.2 All sub-mains cables shall be of copper conductors, XLPE insulated, SWA and LSZH sheathing and shall be a minimum 1000V rating unless specified otherwise. The conductors shall be stranded, and each insulated with an LSZH sheath. Sheathed conductors shall be covered with an overall LSZH extrusion to form a bedding for single galvanised steel wire armouring. The entire cable shall be covered with an extruded black LSZH sheath of the flame retardant to where the cable is installed within the building.

34.2.3 The maximum permissible volt-drop from source to supply for the entire electrical installation shall be 4%.

34.2.4 All cables shall be continuous in their length and terminations shall be complete with LSZH glands, shrouds, locknuts, and earth tags. Strictly no jointing of cables will be permitted without written permission of the Engineer.

34.2.5 Final connections of conductors to switches, busbars etc., shall be by means of crimped copper lugs, brass set screws, spring washers, washers, and nuts, or to the switchboard manufacturers cable clamps.

34.2.6 Sub-distribution cables shall be arranged in groups of cables (touching) on cable tray or ladder rack. The space to be provided between adjacent groups of cables shall be twice the overall diameter of the largest cable in either of the adjacent groups.

34.2.7 All sub-mains cables rising through the building shall be cleated to cable ladder. PVC cable ties will not be permitted other than for horizontal cable runs where the cables are laid into cable containment system. Cables shall not be inverted to cable containment.

34.2.8 All runs of sub mains cabling within the building shall be installed in strict accordance with the manufacturer's requirements and bends in the cable shall be a minimum radius of 8 times the overall diameter of the cable.

34.2.9 Low Voltage Cables shall be supported on dedicated cable containment tray and ladder systems separate from all other including Medium Voltage cables. A clear separation distance of minimum 300mm shall be maintained between LV and ELV data and signal cables where cable runs are parallel.

34.2.10 All sub-distribution cables shall be served by separate Circuit Protective Conductors (C.P.C.'s) as detailed on the design drawings. The C.P.C.'s shall be fixed to the conductor served along the entire route of distribution. The armouring of sub-mains cables shall also be used in association with the C.P.C.'s as an additional parallel earth path.

34.2.11 The colour coding of the phase and neutral conductors shall be in strict accordance with the NSAI Wiring Regulations, I.S. 10101:2020+AC2:2025.

34.2.12 Each cable shall be labelled using the cable reference numbers. The means of identification shall be either an engraved plastic or brass label securely fixed to the cable with cable ties or a stamped brass or aluminium label securely fastened to the cable with galvanised iron or tinned copper bonding wire.

34.2.13 Cable identification labels shall be installed within 300mm of every termination and along the entire route at approximately every 25m or change in direction, etc.

34.2.14 Cores of all control cables will be identifiable either by means of the cable core numbering system or by means of proprietary identification ferrules.

34.2.15 All cables shall be selected from recognised manufacturers with proven test data to ensure conformity with all relating standards. Spurious cables shall not be permitted.

34.3 FIRE RATED CABLE INSTALLATIONS

34.3.1 All fire rated cabling shall be tested and manufactured in accordance with BS 7846:2015 and BS 8491:2008 and bends in the cable shall be a minimum radius of 8 times the overall diameter of the cable.

34.3.2 Any fire rated cables used on this project, typically for firefighting services, shall be installed in accordance with BS 8519:2010. Cables shall consist of stranded copper cores with XLPE insulation, LSZH inner sheath, steel wire armouring (XLPE/LSZH/SWA) with a PH120 rated fire-resistant outer sheath. All fire rated cabling shall be installed and fixed in strict accordance with manufacturer's guidelines.

35. CABLE CONTAINMENT SYSTEMS

35.1 OUTLINE DESCRIPTION

35.1.1 The Contractor shall be responsible for the supply and installation of complete cable containment installations to ensure a complete working installation. Cable containment systems as detailed on Defence Forces Drawings are representative of primary minimum containment requirements. The contractor will determine additional cable containment to supplement the primary containment. The provision of additional containment as well as all ancillary components and supports shall be deemed included.

35.1.2 The Contractor shall be responsible for the Design, Selection and installation of all cable containment support systems to include anchor systems and metal framing supports. The Contractor shall be responsible for determining the appropriate components, materials and methods of installation based on the fully loaded capacities +50% of proposed cable containment systems and the structure from which the systems are to be mounted. These support system hangers shall be spaced at intervals of not greater than 1.8m and when fully loaded shall not deflect between supports. The Contractor shall consider all requirements when making selections and shall reduce spacing of supports as required but shall not increase spacings. Additional supports are to be provided at intersections and any changes in direction.

35.1.3 The Contractor shall provide details of all anchors and fixings for review by the Engineer and shall allow for "pull-out" testing to verify selections based on site conditions.

35.1.4 The Contractor shall co-ordinate all containment routes with those of other services and shall liaise with the Specialists in their production of agreed coordinated installation drawings. The Contractor shall refer to Defence Forces drawings to ensure all ceiling void depths are maintained and that all structural restrictions are known. The Contractor shall note adequate depth shall be maintained beneath cable containment systems for recessed lighting and other recessed electrical equipment. Failure to make

provisions in regard to the above will result in the Contractor being responsible for alterations to installed cable containment at their own expense.

35.1.5 The Contractor shall include for supply and installation or rerouting of the cable tray system for conveyance of modular LV final sub-circuit wiring systems to new Emergency Lighting.

35.1.6 The cable tray sizes indicated will be the minimum size acceptable. The Contractor will, prior to installation, satisfy themselves as to their adequacy and will advise the Engineer if any of the tray sizes need to be increased. The contractor will include for all necessary supports and hangers.

35.2 EQUIPMENT

35.2.1 CABLE TRAY

Cable tray shall be in accordance with IEC 61084-1:2017 and EN 61537:2007 Cable Tray shall be heavy-duty, hot-dipped, galvanized steel with perforated tray base suitable for fixing cables. Heavy duty gauge with returned flanges to EN 61537:2007 shall be utilised.

Constructed from mild steel and hot dipped galvanised to BS EN 10346:2015.

Cable Tray sizes shall be as shown on the Defence Forces drawings.

Cable Tray shall have return flange at side tops for maximum strength.

Provide proprietary fittings (bends, tees, crossovers, reducers, and risers) to fit routing as shown on the Drawings. Tray radii shall maintain allowable cable bending radii.

Cable trays at ceiling level to ground and first floor shall be white in colour and as per schedule.

35.2.2 CABLE TRUNKING

Cable trunking shall be in accordance with EN 50085-1 and EN 10346:2015.

Interior trunking shall galvanised sheet steel per EN 50085-21:2006+A1:2011, EN 50085-1:2005+A1:2013.

Trunking shall be manufactured from heavy gauge, hot-dipped galvanised sheet steel per EN 10346:2015.

All accessories - including lids, couplings, offsets, elbows, expansion joints, adapters, end caps, attachment assemblies, hold down straps and suspension brackets shall be provided to form a complete system. The complete system shall be selected from manufacturers standard components. Site formed assemblies or modification to standard components will not be permitted. Provide cable retainers every 600mm. Bends and tees shall be gusseted.

Cable trunking shall be loaded to a maximum of 50% capacity.

35.2.3 CABLE BASKET

The entire steel wire cable tray system shall be hot dipped galvanised steel with 60 – 80 microns of zinc. All welds shall be manufactured to a tensile strength of 700kg per weld.

35.2.4 CONDUIT

Conduit and fittings shall be in accordance with IEC 61386-1:2008+A1:2017 Conduit shall be Heavy gauge, seem welded, Class 4, hot-dipped galvanised steel, zinc-coated screw threads and zinc bichromate outer coating to comply with BS 4568.

35.2.4.1 Fittings shall be threaded, zinc-coated malleable iron or steel.

35.2.4.2 Expansion couplings for rigid steel conduit shall have earth jumper or internal bonding assembly.

35.2.4.3 Rigid steel conduit, Metal conduit and fixings shall be corrosion-resistant and must not be in contact with dissimilar metals likely to set up electrolytic action.

35.2.5 All equipment and ancillary components must be selected from the same manufacturers range.

35.2.6 The contractor shall provide technical data sheets for the cable containment. The contractor may also be requested to provide samples of all cable containment for approval by the engineer prior to placing the order.

35.3 INSTALLATION

35.3.1 All cableways, wireways, trunking and conduits and all associated ancillaries shall be installed in such a manner as they are fully accessible and suitable for additional wiring and re-wiring without the need to dismantle other services or building elements. Any items failing to comply shall be rectified at the contractor's own expense.

35.3.2 The contractor shall determine from the cable loading with provision for 100% spare capacity the weight per linear meter of installed cable systems and all fixing and support systems shall be selected on this basis. The Main Contractor shall be advised of this weight in order that the grounds or structure is appropriate.

35.3.3 Support conduit in accordance with NSAI Wiring Regulations I.S. 10101:2020+AC2:2025. Ensure conduit is not under mechanical stress. Fix conduit boxes independently on conduit. Make allowance for any additional mechanical loading supported by conduit boxes.

35.3.4 Cable tray and trunking sizes are as indicated on the drawings are to allow for actual and spare circuits when connecting to distribution board. The contractor shall maintain 50% future spare capacity.

35.3.5 Cable containment systems must be carefully installed to maintain electrical continuity between sections. Riveted, screwed or bolted jointed will be acceptable provided contact surfaces are good conductors. The joint connection must be the same shape and area so that the metallic section is maintained over the full length of the run. The use of bonding wires between two sections of tray, trunking etc., will not be accepted.

35.3.6 Manufacturers recommended installation instruction shall be observed at all times especially during the construction of tees, angles, crossovers, reducers and radius bends. Easy sweep (45°) bends shall be incorporated at all changes of direction to ensure that the cable carrying capacity of the basket tray network or the bending radii of cables is not affected.

35.3.7 Cable Containment systems shall be cut clean and square with axis, prepare ends and remove burrs and sharp edges. Ensure inside of trunking / cable ways are free from anything liable to damage cables either during installation or after covers are fitted. Use only factory formed openings for accessories. Line unprotected apertures in trunking and tray with PVC or nylon edging strip.

35.3.8 The contractor shall refer to the manufacturer's cable tray and ladder rack recommendations prior to commencement of the installation.

35.3.9 Ladder racks, cable tray and trunking systems shall be exposed and accessible. Adequate space shall be provided to install and maintain cables. Separation distances of 150mm minimum shall be maintained between piping and all cable containment systems.

35.3.10 Installation shall be electrically continuous - earthed and bonded. Join sections with straight couplings with a copper bonding strap. All containment systems shall be mechanically and electrically continuous.

35.3.11 Provide grommets or brass bushes for extra low voltage cable exits cut in cable tray. Interiors of trunkings shall be free of sharp edges that may damage cables.

35.3.12 Trunking shall be supported to avoid sagging with manufacturer's brackets spaced at less than 1000 mm and with additional brackets at intersections, tees and bends. Use radius or fillet bends at corners. Tee sections shall have no reduction in cross sectional area between main and tee.

35.3.13 Multi-compartment trunking shall be complete with metal dividing fillets with same gauge as trunking material.

35.3.14 Conduits shall have a sufficient number of supports to make rigid installation. Support conduits at 1200mm centres and 200mm on either side of bends, sets or terminations. Conduit bends shall be as stated in the regulations.

35.3.15 Conduit sizes shall be from standards 20mm 25mm, 32mm. with no less than 25mm dia. to be used for fire detection and ICT cabling.

35.3.16 Conduit recessed into solid wall construction shall provide minimum depth of cover of 12mm to allow for render finishes.

35.3.17 The contractor shall use keyhole spacer bar saddles for surface conduit and two-hole saddles for concealed conduit.

35.3.18 Sub-mains cables shall be 'cleated to cable ladders' by means of 'U' bolt cable cleats. Smaller cables shall be fixed to cable trays by means of Insuloid, black P.V.C. adjustable clips c/w set screws, nuts and washers. The use of cable ties shall not be permitted.

35.3.19 Where utilised the steel wire basket system shall incorporate a fast coupling system where each straight section of tray is joined to another section with a minimum of three No. couplers at each side and in the floor of the tray. All bends within the system shall be formed via the proprietary nut bolt and clamp assembly.

35.3.20 Where the steel wire cable basket system is used within the vertical rising elements, the electrical contractor shall utilise the appropriate vertical mounting accessories at 1 metre intervals along the entire length of the tray.

35.3.21 All steel wire basket sections shall be cut on site via the proprietary side action bolt croppers to ensure that safe edges are left on the tray.

35.3.22 The contractor shall specifically note the requirements of the Specification Section 29.2 and shall take full cognizance of same before commencement of any cable containment systems.

35.3.23 The contractor shall reference all sections and reflected ceiling drawings before commencement of installation of any cable containment such that adequate space is provided.

35.3.24 The contractor shall reference all drawings and shall note all service void depths and obstructions.

35.3.25 The contractor shall co-ordinate all services routes with proposed recessed equipment, lighting, speakers, grilles etc and ensure provisions for same are maintained.

35.3.26 The contractor shall ensure that all cable ways passing through a fire barrier, compartment wall, through floors, ceilings and roofs incorporate suitable fire barriers of fire resisting material to prevent fire spread along cable ways. Fire barrier kits for electrical trunking and trays must comply with BS 476 Part 22 (1987), and EN 1363-1:2020. Fire barriers shall achieve integrity of not less than 180 minutes.

35.3.27 Major openings for the passage of cable trays and trunking shall be sealed utilising intumescent fire and smoke seal pillows or intumescent high-density rock fibre slab.

35.3.28 PVC trunking systems shall be fitted with an intumescent wrap which shall be capable of crushing the trunking in the event of a fire.

35.3.29 Labels shall be provided to all cable ways clearly indicate the location of fire barriers.

35.4 Testing & Commissioning

35.4.1 Testing and commissioning shall be carried out in accordance with current NSAI Wiring Regulations I.S. 10101:2020+AC2:2025. Test to ensure electrical continuity of bonding and earthing connections. Maximum of 3.0 Ohms resistance to building earthing connection. Where discontinuities occur at adjustable splice plates and expansion splice plates, provide a 16sqmm copper jumper earth strap.

35.4.2 Upon completion of the work the entire installation shall be checked to inspect sections, fittings, and accessories. The contractor shall remove burrs, dirt and construction debris and repair damaged finish including chips, scratches, and abrasions. Repair galvanized finish damage with zinc-rich paint recommended by tray or trunking manufacturer.

35.4.3 Fire stopping shall be fitted at each location where trunking passes from one building fire zone to another. The electrical contractor shall refer to architect's drawings for details of fire barriers and zones. The Contactor as part of their responsibilities as BCAR "ancillary certifier" shall inspect and record all firestopping provisions and include photographs and scheduled locations are part of his BCAR inspection reports.

35.4.4 The electrical contractor shall include for the supply and installation of the appropriate coloured labelling tags throughout the entire length of the containment installations.

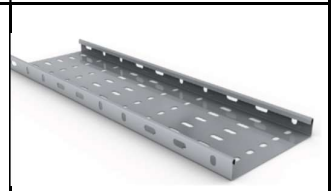
EMERGENCY LUMINAIRE SCHEDULE

Project Name: Pearse Officers Mess - Project No.: 202105 - Schedule Title: **FDAS/EL SCHEDULE -** Schedule Ref.: **FDAS/EL-SCH-01**

Reference	Description	Lamp (Type / Wattage OR Lumen Output / Colour K)	Control Gear	Manufacturer	Model	Dims (mm) / Weight (kg)	Image
E1	SURFACE MOUNTED HIGH PERFORMANCE LED SELF CONTAINED NON-MAINTAINED EMERGENCY LUMINAIRE FOR SAFETY EQUIPMENT LINKED TO ATS (CGLine+).	6.7W LED	SEE NOTE 4	EATON	GuideLed SL	195 X 195	
E2	SURFACE MOUNT HIGH PERFORMANCE LED SELF CONTAINED NON-MAINTAINED EMERGENCY LUMINAIRE LINKED TO ATS (CGLine+).	2W LED – 200lm Asymmetric Distribution	SEE NOTE 4	EATON	FlexiTech SE	228 X 120 X 31.2	
E3	SURFACE MOUNT HIGH PERFORMANCE LED SELF CONTAINED NON-MAINTAINED EMERGENCY LUMINAIRE LINKED TO ATS (CGLine+).	2W LED – 200lm Symmetric Distribution (FT2SE-LO Accessory)	SEE NOTE 4	EATON	FlexiTech SE	228 X 120 X 31.2	
Exit	MAINTAINED EMERGENCY EXIT DIRECTIONAL SIGN LINKED TO ATS (CGLine+).	LED 0.3 – 1.1W	SEE NOTE 4	EATON	FlexiTech EW/EC	326-231 X 178-125-86 X 38-34 (30 to 20 to 12m)	

202102-EL-SCH-01

EMERGENCY LUMINAIRE SCHEDULE

ATS	CGL+ CGVision Touchscreen G/Controller: Group visualisation with full configuration and monitoring of up to 9 external CGL+ Controllers	<12W standby <38W full load	SEE NOTE 4	EATON	CGLine+ CGVision Touchscreen G/Controller	345 x 397 x 111	
External	NON_MAINTAINED DURABLE CAST ALUMINUM ALONG WITH THE HIGH DEGREE OF PROTECTION (IP65) (CGLine+)	2x1.6W (7.2VA/7W, 225lm)	SEE NOTE 4	EATON	Outdoor Wall	303 x 194 x 160	
Cable Tray	Medium Duty Powder Coated **RAL 9010** Cable Tray below ceiling.	(N/A)	SEE NOTE 4	Unitrunk	CP-MR100T	100 width	

Notes

1 ALL LED LUMINAIRES TO BE TESTED IN COMPLIANCE WITH EN 62722-1 OR COMPONENTS TO EN 62717-1

2 All equipment is to be supplied as specified, or equal and approved by the Engineer, Lighting Designer and Client.

3 Where a discrepancy between the model number and other luminaire details occurs, the Contractor shall allow for the most expensive option. The Engineer should be notified of the discrepancy immediately. No claims for delays arising from information discrepancies / inaccuracies will be considered valid.

4 As per latest manufacturer's specifications.

5 COLOR CONSISTENCY MAXIMUM 3 SDCM.

6 Min life expectancy performance L70/B50 50,000 hrs.

7 CE certification must be provided for all luminaires.

Revision	A					
Date	04/09/2026					
Made	SP					
Checked	AQ					
Approved	JP					

APPENDIX B

TYPICAL INFORMATION REQUIRED

TO BE HANDED OVER TO THE EMPLOYER'S REPRESENTATIVE

ON COMPLETION OF THE PROJECT AND TO BE MADE AVAILABLE TO THE PSDP TO ALLOW

COMPILATION OF THE SAFETY FILE

a. Identification of and locations of all potentially hazardous materials (eg certain insulation materials, two pack and other special paint coatings) and installations and the procedures to be followed in order to minimise the associated risks:

   i) in the daily use of the building or structure

   ii) when maintenance, repair, refurbishment or replacement of the materials or installations is to be undertaken.

b. Marked up construction drawings showing how the work was built where it differs from the requirements shown on the drawings issued to the Contractor. Information may be provided in the format of drawings marked up by hand in sufficient detail to allow the design staff to prepare the 'as built' drawings.

c. Specifications and details of pipe and cable run layouts and fixed systems. Information may be provided in the format of drawings marked up by hand in sufficient detail to allow the design staff to prepare the 'as built' drawings.

d. Details of fixed equipment and systems including charts and manuals specifying the operating procedures and maintenance requirements and procedures.

e. Test and commissioning certificates for mechanical and electrical installations installed or altered as part of the Works.

f. Design criteria, where design work formed part of the Contract, for structural elements and for electrical and mechanical systems.

g. Details of existing services and utilities encountered - either underground or in buildings - during the course of the Works, stating their location and describing them.